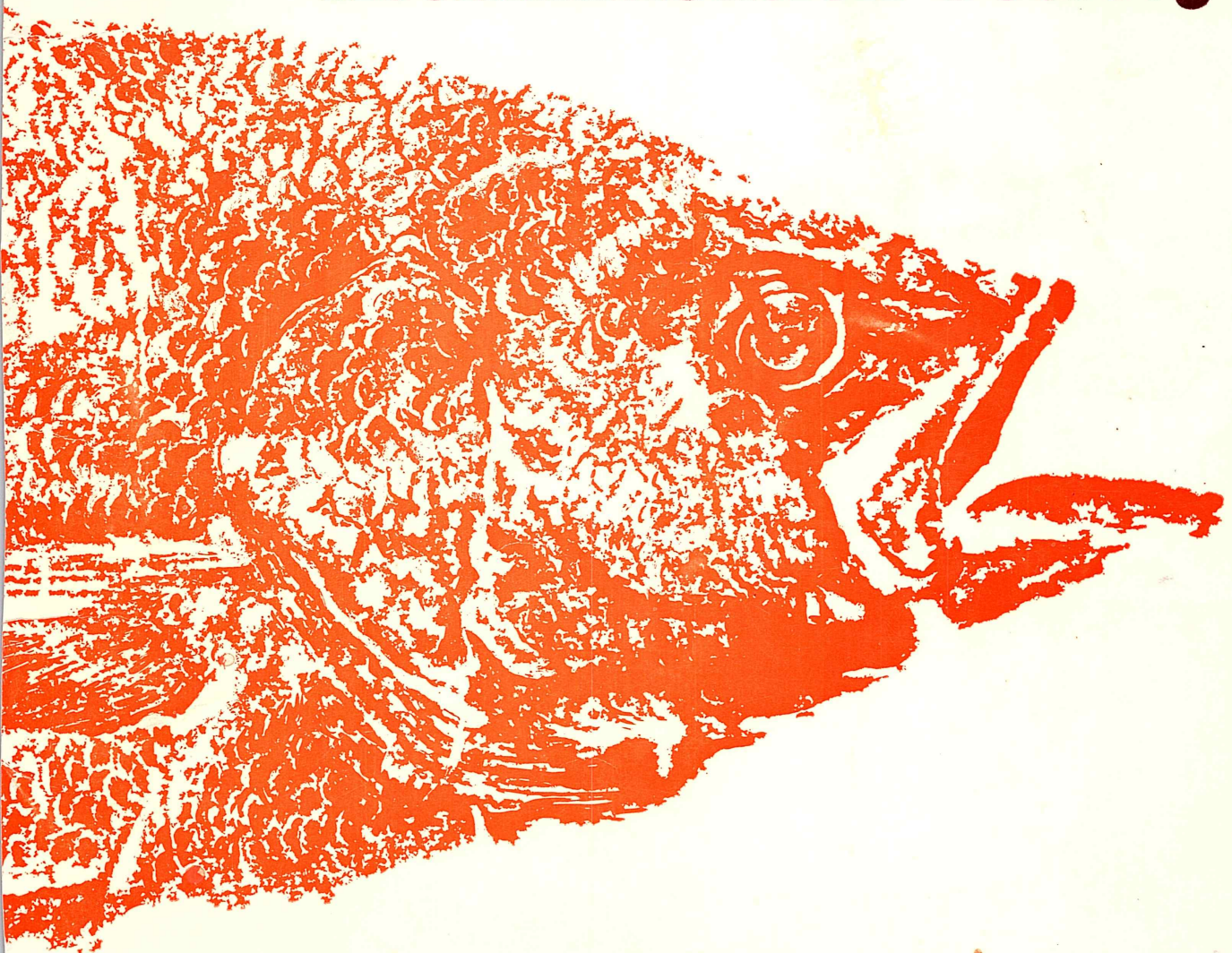


ANNUAL REPORT 1973

Southland Acclimatisation Society



As members only can vote at the Annual Meeting, it will be necessary for you to produce your Membership Card at the time of entering the hall and signing the attendance register. The Annual Report cannot be taken as evidence of membership.

Notice of annual general meeting

The Annual General Meeting of the Southland Acclimatisation Society will be held in the Federated Farmers Lounge, Forth Street, Invercargill, at 8 p.m. on Thursday, 29th November, 1973.

BUSINESS:

1. ADOPTION OF ANNUAL REPORT AND ACCOUNTS
2. ELECTION OF OFFICE BEARERS
3. ELECTION OF AUDITORS
4. GENERAL

C. A. McCULLOCH,
Secretary,

INVERCARGILL
9/11/73

Annual report and accounts

FOR THE YEAR ENDED 31 AUGUST 1973

TO BE PRESENTED TO THE ANNUAL GENERAL MEETING OF MEMBERS
WHICH WILL BE HELD IN THE FEDERATED FARMERS LOUNGE, FORTH
STREET, INVERCARGILL AT 8 p.m. ON THURSDAY 29 NOVEMBER 1973.

President:

A. J. C. DONALD, Esq.

Vice-Presidents:

Messrs F. B. HENDERSON and S. L. LOBB

Life Members:

Messrs A. G. FRASER, F. B. HENDERSON, O. A. B. SMITH

Secretary and Treasurer:

C. A. McCULLOCH, A.C.A.

Permanent Staff:

R. R. SUTTON (Senior Field Officer)

Messrs J. MACKINTOSH, R. BOUD, I. A. MATHIESON, A. J. RUSSELL

Councillors:

W. T. BARKER
W. W. CAMPBELL
A. J. C. DONALD
C. W. DONALD
J. E. FLYNN
R. W. GOODALL
F. B. HENDERSON

J. J. JOHNSTON
I. H. KERR
S. L. LOBB
P. LOW
B. R. McPHERSON
C. O. MARSHALL
W. J. MURRAY

A. L. NAYLOR
G. PATRICK
A. S. REEKIE
A. G. SHAND
R. B. STEWART
E. J. TAPPER

Solicitors to the Society:

RUSSELL & RUSSELL

Administration

SOUTHLAND ACCLIMATISATION SOCIETY

Annual Report

The Council has pleasure in submitting to members the Annual Report and Accounts.

Executive Committee:

The accounts overleaf show the financial operations of the Society for the past year and supply the information required by the Wildlife Regulations.

Game licences show an increase of 202 and fishing licences an increase of 89 on last year's figures.

As with the rest of the community, Council has experienced an increase in costs and despite an increase in revenue the Accounts overleaf once again show a deficit. This is the fourth year in succession that we have shown a deficit.

The analysis of the Annual Accounts shows that this deficit has been brought about mainly by an increase in Field Staff expenses and Fisheries expenditure. In contrast with most of the community the increase in field staff expenses is due more to increased vehicle running expenses than increased wages while the increase in fisheries expenditure is explained by the \$2,000.00 contribution to the Orawia Willow Clearance scheme. The balance of the society's contribution to this scheme (\$2,000.00) will fall in the 1973-74 financial year.

The following is a comparative statement of licence sales.

Game Licences:	1969	1970	1971	1972	1973
	3398	3585	3480	3558	3760
Fishing Licences:	1968-69	1969-70	1970-71	1971-72	1972-73
Whole Season—					
Men	3905	4044	3772	3925	3755
Women	621	656	626	610	647
Boys	3953	4065	4346	4479	4540
Half Season—					
Men	494	362	405	336	361
Weekly	166	216	183	193	221
Day	644	777	735	675	746
Compassionate	—	—	205	51	88
	9,783	10,120	10,272	10,269	10,358

Property:

Property owned by the Society has been maintained in good condition with regular maintenance being carried out on all buildings.

During the year the Game Farm shed was extended to provide much needed storage space.

Attendance at Meetings from 3 October 1972 to 13 September 1973:

The following are the attendances for the past year. The possible attendances are listed above and the actual meetings attended below.

	6	11	5	3	5	2
	Game	Council	Angling	Wildlife	Pollution	Executive
Barker	3	9	—	—	—	—
Campbell	5	8	3	—	—	—
Donald, A. J. C.	5	11	5	3	4	2
Donald, C. W.	5	11	5	—	—	—
Flynn	1	9	1	—	—	—
Goodall	4	10	3	—	—	—
Henderson	6	11	5	3	1	2
Johnston	—	11	4	—	—	1
Lobb	6	11	—	3	1	1
Low	—	7	2	—	4	—
McPherson	1	9	5	1	5	2
*Mortensen	5	5	—	—	3	—
Marshall	2	8	—	3	1	1
Murray	5	7	2	1	1	—
Naylor	—	7	—	—	—	—
Patrick	2	9	3	—	—	—
Shand	6	10	—	3	1	—
Reekie	—	9	4	1	2	—
Stewart, M. H.	—	2	1	—	—	—
Tapper	6	10	4	—	1	—
†Kerr	1	3	—	1	—	—
**Hinton	—	1	—	—	—	—
**Pannett	—	2	1	—	—	—
Stewart, R. B.	—	7	—	2	1	—

**Resigned at Annual Meeting 16 November 1972.

*Resigned during year.

†Appointed during year.

Committees:

Chairmen for the past year have been:

Game—Mr F. B. Henderson

Angling and Research—Mr J. J. Johnston

Wildlife Committee—Mr C. O. Marshall

Pollution—Mr B. R. McPherson

President:

Mr A. J. C. Donald was re-elected President of the Council.

Vice-Presidents:

Messrs F. B. Henderson and S. L. Lobb were re-elected Vice-Presidents.

Retiring Councillors:

Messrs E. J. Tapper, J. J. Johnston, I. H. Kerr, A. L. Naylor, W. T. Barker, G. Patrick, A. S. Reekie, R. B. Stewart.

Auditors:

Messrs. O. C. Pierce and Co. offer themselves for re-election as Auditors.

Scientific Adviser:

The appointment of Dr Scott as our Scientific Adviser last year has proved to be a great value to the Society. This was particularly evident when objections to the Preliminary Southland Water Classification were heard. There can be no doubt that the evidence given on our behalf by Dr Scott greatly assisted our case. We are indebted to Dr Scott for the work both he and his students have undertaken, and are undertaking, on our behalf and for the valuable advice which he has given us.

Staff:

Staff has remained unchanged during the year. However we regret to advise that Field Officer Bob Boud has tendered his resignation as from 30 September, 1973. Bob has been a valuable member of our staff for the last nine years and has been particularly active in the fields of Fisheries Management and Pollution Control. Bob leaves us to take up an appointment as Senior Field Officer with the Waitaki Valley Acclimatisation Society and we wish him well in his new position. Field Officer Ian Mathieson will be assuming responsibility for the Western District later this year and will be shifting back to his property at Longwood near Riverton. At the time of writing, the Executive are considering applications for the position of Field Officer, stationed at Lumsden.

Council:

During the year Mr P. E. Mortensen tendered his resignation due to his transfer to Auckland. Mr Mortensen was a valuable member of Council and contributed in a worthwhile way to the Society's work, during his term as a Councillor. His seat was taken by the highest polling unsuccessful candidate at the last election, Mr I. H. Kerr. Mr Kerr was already conversant with council work as he had been a regular observer at Council meetings. It is perhaps worth mentioning again that any member has the right to attend a Council meeting as an observer.

Meetings of Licence Holders:

During April 1973 Licence Holders meetings were held in Winton, Otautau, Lumsden, Gore and Invercargill. Some of these meetings were well attended and worthwhile discussion took place; others were not so well attended. However overall the meetings must be regarded as successful and a worthwhile extension of Council's efforts to keep members informed.

Obituary:

On 25 June 1973 a Life Member of the Society, Mr G. F. Strang passed away. Mr Strang will be remembered for his tireless work for the Society and the mere fact that he was a Life Member of the Society speaks for itself. His passing is noted with deep regret.

Regional Finance Scheme:

The final draft of the Regional Finance Scheme was placed in the hands of the National Party Cabinet but was held over until after the General Election. Since then a new Cabinet has taken over and they have discussed the Regional Finance Scheme and referred it back to the Departments for a full report on Wildlife in general throughout New Zealand before making a decision.

During March, the National Executive had discussions with the Ministers of Agriculture and Fisheries, and Internal Affairs, on this matter, and received their assurances that a full report will be made available within three or four months. In addition they agreed that the National Executive will be informed of the contents before it is presented to Cabinet. At the time of writing we have nothing new to report.

In light of these developments we cannot expect the Regional Finance Scheme to take effect before the 1974 Game Season. This has been very disappointing for the National Executive who have, and still are, giving a lot of their time to the implementation of the Scheme. Unfortunately the wheels of officialdom are slow in turning.

A. J. C. DONALD, President

C. A. McCULLOCH, Secretary

Southland Acclimatisation Society

Revenue and Expenditure Account for the year ended 31 August 1973

REVENUE FOR THE YEAR WAS:

FISHERIES:

	No.	\$	\$
Whole Season Adult Male	3,755	22,530	
Half Season Adult Male	361	1,624	
Whole Season Women's	647	1,941	
Boys' and Girls	4,540	4,540	
Weekly	221	442	
Daily	746	560	
Compassionate	—	231	

Less Marine Department Levy 15%		31,868	
		4,780	
			27,088

Fines 27,088 323

WILDLIFE:

Game Licences	3,760	22,560	
Endorsements		279	

Less South Island Council Levy 50c		22,839	
		1,880	

Fines 20,959 156

OTHER INCOME:

Interest		1,908	
Hut Hire		519	
Rent		312	
Donations Received		51	
Profit on Sale of Fishing Books		12	
Fish Salvage Reimbursement		410	

3,212

51,758

FROM THIS WE ALLOW THE FOLLOWING EXPENDITURE:

FISHERIES:

Willow clearance work	2,000	
Freshwater Fisheries Levy	2,628	
Commission on Licence Sales	946	
Printing Licences	594	
Hut Maintenance (at cost without staff wages or travelling expenses)	235	
Fisheries General Expenses	154	
Shag Destruction	13	
Fisheries Equipment - Repairs and Maintenance	49	

6,619

WILDLIFE:

Game Farm Expenses	589	581
Wildlife Refuges, Game Management Areas, and closed Game Areas expenses	800	
Less Grant from South Island Council (partly relating to 1972 year)		211
Commission on Licence Sales		717
Printing Licences		318
Game Farm Rates, Repairs and Maintenance		107
Wildlife General Expenses		519
Pond Development		126
Wildlife Equipment Repairs and Maintenance		40

2,197

POLLUTION:

Pollution Control Programme		545
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FIELD STAFF:

Wages	18,978	
Rangers' Expenses	1,457	
Rangers' Superannuation	1,261	
Motor Vehicle Running Costs, Insurance, Petrol, Maintenance, Depreciation	9,891	

31,587

ADMINISTRATION:

Secretarial and Office Equipment, Expenses and Rent	5,082	
Advertising, Printing and Stationery	2,641	
Insurances	487	
Audit Fee	200	
Legal Expenses	297	
South Island Council Administration Levy	887	
South Island Council Pollution Levy	18	
Telephone and Tolls	1,102	
General Expenses	613	
Newsletter - Preparation and Printing	328	
Travelling Expenses	1,371	
Depreciation	1,037	
Rates, Repairs and Maintenance Houses	253	
Interest	64	

14,380

55,328

WHICH TOTALLED

This resulted in a Net Deficit transferred to:

Accumulated Fund	3,464	
Duck Habitat Construction Fund	126	

\$3,590

Balance Sheet as at 31 August 1973

WE HAVE THE FOLLOWING ASSETS:

CURRENT ASSETS:

Bank of New Zealand	10,304	
Bank of New Zealand Conservation and Anti-Pollution Trust Account	257	
Stock Trout Fishing Books	159	
Sundry Debtors	88	
TOTAL CURRENT ASSETS		10,808

INVESTMENTS:

Southland Harbour Board	3,000	
Southland Building Society	5,000	
Invercargill City Council	3,000	
B.N.Z. - Short Term Deposits	12,000	
Gore Sewerage Loan	5,000	
TOTAL INVESTMENTS		28,000

FIXED ASSETS:

Land	1,300	
Game Farm House	4,968	
Less Depreciation	178	
		4,790
Game Farm Shed	5,247	
Plus Additions	2,429	
		7,676
Less Depreciation	147	
		7,529
Game Farm Shed Furnishings	220	
Less Depreciation	44	
		176
Lumsden House	8,920	
Less Depreciation	280	
		8,640
Office Lornville	485	
Less Depreciation	13	
		472
Motor Vehicles	12,192	
Plus Additions	3,931	
		16,123
Less Sold	1,325	
		14,798
Less Depreciation and Loss on Sale	3,302	
		11,496
Power Pony Mower	538	
Less Depreciation	107	
		431
Anglers' Huts	1,840	
Less Depreciation	40	
		1,800
Plant	2,091	
Plus Additions	401	
		2,492
Less Depreciation	228	
		2,264
TOTAL FIXED ASSETS		38,898
TOTAL ASSETS		77,706

FROM THIS WE DEDUCT:

SUNDRY CREDITORS:

AND PROVIDE FOR SPECIFIC FUNDS:

Staff Retiring Provision	54	
Mataura Pollution Analysis Fund	118	
Duck Habitat Construction Fund	3,978	
Less Paid this year	126	
		3,852
Wildlife Habitat Conservation Fund	2,000	
Conservation and Anti Pollution Fund	257	
Spartina Research Grant	180	
		26,068
		51,638

AND THIS LEAVES

REPRESENTED BY—ACCUMULATED FUNDS:

Last years Balance	55,102	
Less Net Deficit this year	3,464	

BALANCE 31 AUGUST 1973

\$51,638

NOTE: The Society receives an annual sum of interest from a perpetual endowment with the Public Trust. The endowment is not shown in the Balance Sheet.

AUDITORS' REPORT

We report that we have examined the books and accounts of the Southland Acclimatisation Society and have received all the information and explanations we have required. In our opinion the Balance Sheet together with the Revenue and Expenditure Account for the year ended 31 August 1973 show a true and fair position as at 31 August 1973.

INVERCARGILL
23 October 1973.

O. C. PIERCE & Co.
Chartered Accountants.

Statement of Source and Disposal of Funds for the year ended 31 August 1973

INCOME (as per Annual Accounts)

From Fisheries	27,411	
From Wildlife	21,116	
From Sundry	3,212	51,739

LESS CASH EXPENDITURE:

Fisheries (as per Annual Accounts)	6,619	
Wildlife (as per Annual Accounts)	2,197	
Pollution (as per Annual Accounts)	545	
Field Staff (as per Annual Accounts less Vehicle Depreciation)	28,285	
Administration (as per Annual Accounts less Depreciation)	13,343	50,989

CASH AVAILABLE FROM REVENUE

\$750

IN ADDITION CASH WAS MADE AVAILABLE FROM

Increase in Current Liabilities	5,738	
Sale of Vehicles	1,325	
Matured Debentures	4,000	
Matured Short Term Deposit	8,000	19,063
		\$19,813

THIS WAS APPLIED AS FOLLOWS:

Additions to Game Farm Shed	2,429	
Purchase of Vehicle	3,931	
Purchase of Plant	401	
New Debenture	5,000	
Increase in Current Assets	8,052	19,813

Analysis of Annual Accounts

This year's deficit of \$3,590 is an increase of \$2,175 or 154% over last year's deficit of \$1,415.

THIS WAS BROUGHT ABOUT BY:

	1972	1973	Net
Wildlife - Net	19,799	20,959	1,160
Fisheries - Fines	105	323	218
Sundry Income	2,533	3,212	679
			2,057
Less Wildlife Fines	465	156	309
Fisheries - Net	27,541	27,088	453

TOTAL INCREASED REVENUE

1,295

LESS INCREASED EXPENDITURE DETAILS OF WHICH ARE:

INCREASES IN			
Field Staff Expenses	27,609	31,587	3,978
Fisheries	4,675	6,619	1,944
			5,922

DECREASES IN SPENDING ON:

Wildlife	3,152	2,197	955
Pollution Control	1,402	545	857
Administration	15,020	14,380	640

NET INCREASE IN EXPENDITURE

3,470

DEFICIT INCREASE

\$2,175

South Island Council

Report on the South Island Council Meeting, held at Nelson on 26 March 1973.

This Society was represented by Mr A. J. C. Donald (President) and by Mr B. R. McPherson a member of the Pollution Committee. Some of the matters discussed have been updated in the report of the September meeting and are therefore not mentioned.

Game Management Grant:

As you will note in the Annual Accounts a grant of \$800 was made to the Southland Society as a contribution towards work done on the Dawson City Swamp Retention Dam and at Lake George.

Committee Appointments:

Mr A. J. C. Donald was appointed to the National Executive, the South Island Executive and the Fisheries Pool Fund Committee and Mr B. R. McPherson was appointed to the National Pollution & Water Quality Committee. In addition to this the Society has one representative on the Salmon Committee.

Water Quality Standards:

Our Society moved that Government investigate water classification standards as they affect fisheries and wildlife with a strong recommendation that the expert opinion of the Internal Affairs Department, Ministry of Agriculture & Fisheries and the Zoology Departments of the Universities be considered. This was carried and subsequent to this further representations are to be made to Government on the subject of water quality standards.

Report of the Meeting of the South Island Council of Acclimatisation Societies held at Lincoln College on Monday 24 September 1973.

This meeting was attended by Mr A. J. C. Donald (President), Mr C. A. McCulloch (Secretary), B. R. McPherson and E. J. Tapper, observers.

Fishing Licence Fees:

As you will all be aware by now Government finally approved the increase in fishing licence fees, operative from the 1 October 1973, for all classes of licences. The timing of Government's approval was regrettable. However once gazetted it is mandatory for all Societies to increase the licence fees on that date.

Electric Fishing Machines:

Following the unfortunate death, while using an electric fishing machine, of one of the Ministry of Agriculture & Fisheries staff, these machines are now no longer available for use. The Ministry is attempting to find suitably qualified personnel to check all machines in New Zealand. Unfortunately to date such personnel have not been located. Accordingly Societies requested that the matter be given urgency as Societies are now unable to use this valuable piece of equipment.

Pollution Training Course:

You will recall that we reported in the last Annual Report that the Marine Department were organising a training course for Society staff in pollution detection work. Unfortunately this course has not materialised. However the National Pollution Committee reported at this meeting, that they intended to organise a modified course and it was hoped that this could be available in the not too distant future.

Increase in Wildlife Offence Penalties:

The Southland Society moved that the maximum penalty for wildlife offences be substantially increased. We pointed out the difference between penalties applicable under the Wildlife Act and those applicable under the Fresh Water Fisheries Regulations. The Department of Internal Affairs agreed that the situation needed reviewing and reported that, in fact, a review was now underway. Accordingly the remit was passed by Council and we can expect a substantial increase in penalties in the near future.

Angling

Angling Committee Report

In presenting this year's report I would like to pay a special vote of thanks to our staff, who, as you will see from some of the staff reports which you will find reprinted here, have assisted my Committee greatly in their efforts to properly manage the angling resources of our district. As usual, the Committee's efforts have been largely directed towards trout habitat maintenance and protection, combined with normal data collection and law-enforcement. During the year we received a first draft of a technical field service report on the Southland Fishery and I will refer briefly to it during the report.

Artificial Stocking:

You will recall at the last Annual General Meeting that considerable pressure was put on Council to commence a programme of artificially stocking certain streams within our area. Council, through the Angling Committee, are very conscious of the comments brought forward by fishermen in general. However in this instance they have been compelled to heed the words of the acknowledged experts in the field. The Society has always maintained that the streams and rivers within our area contain sufficient spawning facilities to maintain the fish population. The fisheries report referred to previously mentions — "The Society leads most other districts in an enlightened approach to two basic aspects of fisheries management, i.e. artificial stocking of the waters and their cropping by anglers. It has been proved that under New Zealand conditions most trout populations, especially in rivers, become self-supporting after their initial establishment. Even stocking of lakes should be carefully considered because in many areas sufficient spawning has proved to occur in apparently unsuitable conditions. Also it has been shown that no angling method is constantly more efficient than others, therefore especially with a large number of junior anglers it is best to allow all accepted sporting methods, except in special circumstances. The large rivers supporting most of this fishing present a real problem in estimating the nature and extent of their fish populations. The use of the electric fishing equipment is limited in deep fast flowing waters. To overcome this difficulty diving has been tried in some large rivers in Wellington and Hawke's Bay and it is found to be very successful as a trout survey technique in most cases. This report is largely concerned with the fish stocks, but in practical management all aspects of the environment have to be considered. Pollution and other undesirable changes are becoming a problem in the district and this Society is rightly concerned about them. This Society has also provided an exceptionally good service to anglers by maintaining huts and access points and publishing excellent information about them and fishing conditions in general. On the whole the Southland Fisheries are in a stable state and the angling effort is probably very favourably distributed in relation to the fish stocks, i.e. most angling is done on the lower and middle reaches of the largest rivers which produce fairly large numbers of medium sized fish. The stocks should be able to withstand any increase in angling pressure for many years to come providing the major fisheries are not allowed to deteriorate through environmental changes",

This report which we understand will be published in the not too distant future, confirms the advice given to us by our Field Staff and the decisions taken by the Angling Committee over the recent years. In view of this no artificial stocking has been undertaken this year. However the staff have been instructed to undertake

further investigations in the northern Southland area, as we are advised that the fish population in some of these streams has definitely diminished. The staff will, as soon as they are able to use the electric fishing equipment again, attempt to verify whether in fact this is the case and then determine, if possible, the reasons for this fall-off in numbers. It could be that a case could be made for artificial restocking in these areas. However the Committee will act only upon staff recommendations.



Mr E. J. Tapper demonstrating Fly Fishing on the School Boys' outing. Mataura River, March 1973

Fisheries Survey of our District:

As mentioned previously, a preliminary copy of this survey has been made available to this Society for comment and I do not propose to deal with it in any depth at this stage as it will no doubt be published in full shortly. However it may be of interest to licence holders to know that the report describes the trout fishery of Southland and is based on angling results collected between 1947 and 1967 under 8 angling diary schemes. It concludes that angling is popular in the district, but in recent years licence sales have dropped slightly. The average men's whole season licence holder fishes for about 15 days to catch 17 fish per season. The total district crop has only increased slightly from about 90,000 fish in 1947 to 110,000 fish in 1967. The total angling effort in 1967 was established at 125,000 days.

The 19 major waters and anglers' catches are described. The Fisheries Regulations are very lenient and fisheries management is on a sound and scientific basis. The following copy of Table 8 from the report gives some indication of the utilisation of the waters within our area, during this period. Perhaps of particular note now, 6 years after the completion of the Scheme, is the relative importance of the Waiau River and its recent decapitation for electrical power generation.

TABLE 8
Estimated Annual Crop of Fish from Southland Waters 1947-1967

Water	1947	1948	1949	1950	1951	1957	1962	1967
Mataura *	31,500	24,500	24,300	23,200	18,100	36,600	46,500	22,200
Otamita	800	2,400	900	700	2,100	1,500	500	1,000
Waimea	2,900	1,800	800	100	2,200	600	100	100
L. Waituna	400	100	100	2,400	200	1,000	100	900
Waihopai	200	1,500	1,200	100	100	100	100	100
Oreti	10,200	12,300	7,300	5,000	8,300	17,300	18,000	18,900
Makarewa	1,200	6,400	400	1,800	1,800	9,200	1,600	1,200
Hedgehope	1,700	100	900	200	200	6,900	800	200
Dunsdale	500	100	500	100	100	2,900	1,000	1,000
Lora	2,100	1,900	300	500	2,900	2,400	1,100	400
Otapiri	1,600	100	1,900	800	2,500	3,600	1,700	4,000
Waimatuku	1,000	2,500	1,300	100	100	1,800	1,800	500
Aparima	15,600	16,800	26,500	22,800	18,000	10,500	6,000	24,200
Waiau	10,200	9,700	10,000	19,600	20,200	6,600	10,200	13,000
Orawia	3,200	4,000	5,300	5,000	4,600	3,500	3,000	500
Morley	1,500	800	2,200	200	2,700	900	400	1,400
Wairaki	200	100	800	100	100	200	300	3,600
Mararoa	900	800	1,000	1,800	100	800	1,200	8,100
Whitestone	100	100	100	100	100	100	100	200
Other Waters	1,200	1,000	1,200	2,400	2,600	7,500	5,500	8,500
Total Crop	87,000	87,000	87,000	87,000	87,000	114,000	100,000	110,000
Total Diaries	144 in 5 years					205	157	102
Total Fish kept by Diarists	3,483	3,116	1,659	2,028	3,424	5,845	4,620	2,439

*Mataura results do not include Otago anglers' catch, which varied between 6,900 and 27,400 per season.

Waiau River:

We are all aware of the effect of the Mararoa Dam on the Waiau River and at this moment in time the likely effect on the river as a fishery is difficult to assess. One thing that can be considered however, is the effect on the lower Waiau fishery of the river mouth blockage. Our Senior Field Officer, Mr Sutton, prepared a report on the 10 May this year, at the request of the Southland Catchment Board, covering some aspects of the likely effects of periodical blockage of the Waiau River Mouth due to hydro-electric development in the Upper Waiau Catchment. The following is a copy of that report which you may find of interest.

Lower Waiau Fishery-Effect of River Mouth Blockage

The following report is made at the request of the Southland Catchment Board, and covers some aspects of the likely effects of the periodical blockage of the Waiau river mouth due to hydro-electrical development in the upper Waiau river catchment.

Species Affected:

The most obvious adverse effects will be on species of fish which are migratory or semi-migratory to and from the sea.

A short list is as follows:

Brown Trout	<i>Salmo trutta</i>
Long-finned eel	<i>Anguilla dieffenbachi</i>
Short-finned eel	<i>Anguilla australis</i>
Lamprey	<i>Geolria australis</i>
Whitebait	<i>Galaxias attenuatus</i> and probably several other species
Smelt	<i>Retropinna retropinna</i>

Trout:

Both Brown and Rainbow trout and probably still a few Atlantic salmon occur in the lower Waiau river. The two latter species are non-migratory, but Brown trout in these waters are known to be of the sea going type.

Waiau mouth has long been renowned for its sea-run trout and is fished extensively both at and above the river mouth and also in the sea adjacent to the mouth. Angling takes place throughout the fishing season (October–April), but the principal movement of trout into the river from the sea occurs from January to April inclusive. Long periods of blockage over these months would largely ruin angling operations. The main damage however would be caused by the prevention of sea-run type Brown trout reaching spawning grounds in upper reaches and tributaries.

It is difficult to predict accurately what effect the general reduction in size and flow of the lower Waiau river will have on all three salmonid species. Initially the general reduction in river bed area will result in over-crowding and reduction in food supply. A drastic fall off in the condition of fish can be predicted as a result of this. A reduction in river velocity is likely to result in still further damage to trout food supply, due to the disappearance of some of the more desirable aquatic food animals which are present in turbulent waters. These will be replaced by less desirable food animals.

Eels:

Of the two species of eel mentioned above long-finned are likely to be the more important. It is well established that both species are spawned in the sea, enter the rivers as immature (whitebait sized) juveniles, and reach maturity over a long period in the river. Juveniles enter the river mouth during November and December and the downstream migration of mature adults occurs in the autumn months of April and March.

Although less obvious, spring blockages of the river mouth are likely to be more damaging, but a late autumn opening, even if only for a short period would be desirable to permit a free downstream passage for mature adults.

Lampreys:

A substantial and well recognised upstream run of Lampreys from the sea occurs in the Waiau river during the winter months of May, June and probably July. These mature adults are known to spawn in the tributary streams Lillburn and Orawia and probably many others. I have no information on the downstream movement of young Lampreys.

Lampreys form a substantial part of the food supply for aquatic birds such as shags and are also held in high regard as an item of food by certain sections of the community.

Whitebait:

The lower Waiau river is well known for substantial runs of whitebait which occur from August to November inclusive. These runs are made up of probably several species of galaxias and attract good numbers of whitebait fisherman during the open season. Whitebait also make up part of the food supply for trout.

Whitebait which are not caught proceed upstream where they mature. The bulk of them return downstream to spawn during early autumn (February–March). Spawning takes place in marginal vegetation in tidal reaches during high spring tides. It is quite clear that unless the river mouth is open during these two critical periods, the whitebait life cycle will be seriously affected. This is particularly so in respect of the spawning period. Spawning is vitally dependant on spring tidal influence over at least two spring tide periods approximately one month apart. Access to the sea following the second spring tide period when hatching takes place is essential.

Smelt:

Very large numbers of smelt run into the Waiau river from the seas during the period from October to December. Spawning apparently occurs in fresh water close to the river mouth. These fish have no direct commercial value but they form a substantial part of the trout food supply in this area and they obviously play an important part in the balance of life in these waters.

The following table summarises the periods when it is important to the various species of fish for the river mouth to be open to the sea.

Species	Desirable Open Period	
	Upstream Movement	Downstream Movement
Brown Trout	January –April	March – May
Long-finned Eel	November – December	March – April
Short-finned Eel	November – December	March – April
Lamprey	May – July	??????
Whitebait	August – November	February – April
Smelt	October – December	??????

Yours faithfully,

R. R. SUTTON

Senior Field Officer.

Research:

During the year our Field Staff completed reports on the Whitestone River investigation and carried out a survey on the Pourakino River with particular reference to the effects of the proposed Beech Utilisation Scheme. These reports are reproduced at the conclusion of the report.

Mararoa Control Structure Fish Pass

In last year's Annual Report we reproduced a copy of our submission to the Electricity Department requesting the installation of a fish pass in the Mararoa Control Structure. I am pleased to advise that following consultations between the Electricity Department, the Ministry of Works, Internal Affairs Department, Marine Department and ourselves, it has been established that the incorporation of a fish pass is a viable proposition and the Minister of Electricity, on the 19 July this year, advised this Society that he has given approval to the New Zealand Electricity Department to arrange for a fish pass to be incorporated in the dam control structure for an estimated cost of \$150,000. We have no doubt that the wisdom of this decision will be appreciated by generations of fishermen yet to come, and the Minister's action in authorising the Department's inclusion of the fish pass in this scheme is to be applauded.

Trout Farming:

The trout farming controversy continued with the National Government promulgating the Fresh Water Fish Farming Regulations 1972 which included a provision for the local sale of farmed trout. This Society deplored in particular this section of the Regulations. However we were advised by the then Government that all fish for local sales would be tagged. This tag would be of a type that is destroyed or altered upon removal so that it cannot be used again on a poached fish. The tag must remain in place until the fish actually reaches the consumer. For this reason the Government considered that there were adequate safe-guards against poaching.

Then we had a change of Government, and on the 21 December 1972 a P.A. release in the local newspaper advised that the Government was prohibiting the commercial farming of trout in New Zealand, except at the Chatham Islands, and that the Fish Farming Regulations 1972 would be amended to allow for the farming of trout on the Chatham Islands only. This decision was welcomed by the Council, although it must be remembered that this Society did not at any stage oppose commercial trout farming provided adequate safe-guards were written into the relevant regulations. Our opposition to the Regulations concerned the conditions contained therein. The situation now stands that no commercial trout farming will be allowed in New Zealand, and in view of the previous Regulations that were promulgated by Government we feel that this is the most desirable state of affairs and we trust that the present Government continues with its policy.

Introduction of Quinnat Salmon:

You will recall in the last year's Annual Report full details of a proposal to introduce quinnat salmon into Southland waters were printed. After thoroughly debating the situation Council decided that the project would not be proceeded with. This decision has always been a controversial one and to ensure that the project is given every consideration a new sub-committee has been set up to ensure that the Society is kept fully informed on the prospects of establishing a Salmon Fishery in Southland. This is a balanced committee and we look forward to its recommendations in due course.

Mararoa Mouth Anglers Hut:

Due to Ministry of Works activity at the dam site at Mararoa river mouth and consequently restriction on angler access to the area, our anglers' hut at that point has had to be shifted. This shift has been made to a new site on the lower Whitestone river just above the bridge on the Hillside-Manapouri highway. Alterations and renovations have been carried out by the field staff and the hut in its new form will be ready for use for the new fishing season. The site is a poor substitute for the old one where angling was always so good, but should be convenient for anglers wanting to fish the lower sections of the Whitestone and Mararoa rivers.

Perch Transfers

A programme of stocking various ponds with Perch to provide fishing for children was started in August this year. Our reservoir of stock is in Lake Murihiku at our game farm. Field Officer Jim Mackintosh who is in charge of the operation has been netting Perch and transporting them to selected ponds. With so much pond building going on in the district, we would be pleased to hear from the owners of larger ponds who may be interested in perch stocks.

Encouragement of the Sport of Angling:

We are indebted to Mr E. J. Tapper for his work in organising an instruction day for young anglers. As our photograph illustrated Mr Tapper did a very fine job, the outing was enjoyed by the boys and there can be no doubt it was of great value to them. Mr Tapper's interest in fostering the sport is illustrated in the following comment prepared by him.

"Somebody once estimated that there were 600 miles of fishable waterways in our Southland catchment.

With our junior licence sales increasing each year, but our adult licence sales remaining relatively static, it appears that many potential younger anglers lose interest in fishing and take up other sports.

Every year many creeks and rivers are subject to dragline operations which often spoil them for future productive fishing. River straightening also tends to make fishing much less interesting.

It would be true to say that a child who becomes interested in fishing and buys the necessary equipment becomes despondent if he or she fails to catch a fish after 4 to 5 outings. Any fish they may catch whether it be a perch, 6 inch undersized trout or perhaps even an eel can stimulate their interest making him or her a lover of the outdoors and an angler for life.

To help cultivate the potential anglers' enthusiasm it has been suggested that a certain stretch of river be set aside for holders of juvenile licences.

It is important that this water be in close cycling proximity to Invercargill.

It is indeed unfortunate that the young generation of today do not have the same opportunities as we did when we were younger. Twenty years ago the Waihopai River was a mecca for the school-boy enthusiasts, in fact, many of us can trace our angling beginnings on the banks of this river. Armed with bamboo rods and tin of worms it was a regular meeting place after school. In those days, there was an abundance of trout, eels, cock-a-bullies, smelt, whitebait and fresh water crayfish to be caught.

Our society sees a need for more recreational fishing areas for juniors and has released perch in ponds, backwaters and gravel pit holes surrounding Invercargill.

We have an obligation to foster and encourage our up and coming young anglers and a suitable stretch of water must be set aside for their exclusive enjoyment.

What do you think of the idea? We would like some discussion on this at the Annual Meeting".

E. J. TAPPER

Trout Salvage:

Drought conditions prevailing during the summer 1973 created an unprecedented trout salvage problem in the northern portion of the district. During this period several thousand trout were shifted by councillors and field staff, from affected streams to stable water.

Streams most affected were the Whitestone, Cromel, Eyre Creek, Upper Mataura, and upper Mararoa.

At the height of the dry period, some sixteen miles of stream bed were totally dry, with an additional fifty miles critically low.

Trout salvage is a time consuming, and rather thankless task, with the main problems being to decide just when operations should commence. If the work commences before water flow ceases many man hours can be wasted, as a few hours' rain can make the job unnecessary. If commenced too late, losses occur through high water temperatures, or poaching activities. Past experience has suggested, that streams holding large fish should be attended to first, usually before ripple flow ceases. This minimizes the poaching problems. Smaller fish will often congregate in the deeper pools and can usually be left safely until after flow ceases.

It is interesting to note the large numbers of small wild-bred stock, present in some of these tributary streams at this time of the year.

Two thousand six to twelve inch fish were shifted from a single pool in the Eyre Creek tributary during February 1973.

Advocates of expensive artificial restocking programmes could perhaps, advantageously spend a day or two on this work.

J. J. JOHNSTON,
Chairman.

Whitestone River Investigation

The object of this investigation was to collect information on the Whitestone river and its trout population so that a suitable management policy could be formulated for the Whitestone fishery. This was considered necessary in view of the increased land development in the Whitestone catchment area.

The Whitestone river has been for many years regarded as a relatively remote angling stream with the reputation of providing excellent angling for large trout for those anglers prepared to walk long distances. Since the advent of the Lands and Survey Department's land development scheme, the Whitestone river has become more accessible to the average angler, and there have been effects on the physical features of the stream, and thus on the trout habitat. Consequently, it was felt that a management policy directed towards the preservation of the present quality of angling in the Whitestone was necessary. Before this could be done, data concerning all aspects of the Whitestone as a fishery had to be collected, plus information on any physical changes that were taking place in the river itself.

RESULTS:

(a) Physical Features—The upper reaches of the Whitestone river, i.e. from the L. Echo outlet stream to Prospect Flat, are more or less in their natural state. The banks are reasonably stable, and covered with tussock and matagouri. Several large holes and undercut banks provide cover for trout. The water is clear, and there is little algal growth. From Prospect Flat downstream, the valley floor has been developed for farming, and is more heavily stocked. Small tributary streams have been channelled, adjacent swamp areas drained, and the surrounding land topdressed. This has had a gradual but detrimental effect on the river as trout habitat. The channelling of small tributaries and draining of swampy areas have increased the rate of runoff into the Whitestone, and has increased the movement of fine shingle on the stream bed. This has resulted in some large holes, especially in the lower reaches, being almost filled in. The increase in the rate of run-off, plus trampling by stock, has caused instability of the banks in many places.

The top dressing and stocking of the middle and lower reaches have probably added nutrients to the water, and an increase in algal growth is evident. A decrease in water quality is also indicated by the disappearance of *Galaxias* downstream from about Long Valley. Below the Kakapo stream, the water is noticeably discoloured, and a heavy algal growth is evident on the bottom, especially in summer low water conditions. Streams such as the Kakapo which drain swamps are particularly susceptible to modification through topdressing of the land.

The draining of wet areas has resulted in the water retention effect of these areas being lost, which causes the Whitestone to become low in the summer, and go completely dry in most years between the Te Anau highway and the Kakapo stream. In drought years, the section of dry river bed may extend almost to the Manapouri road bridge. Water abstraction for domestic and stock use on the Lands and Survey Dept. blocks also affect summer water levels.

(b) Trout—For the purposes of trout sampling, five sample areas from 400 to 600 yds long were selected, and their locations are shown on the map appended to this report. Each sample area was electric fished up to three times a year in January and February, August and September, and December. However, as the investigation progressed, it became obvious that a large enough sample could not be collected from these areas alone, so sampling was extended to cover as much of the river as possible. Sampling was commenced on 22.8.68 and continued to

7.4.71. During this period, a total of 501 trout were handled, ranging in size from 3" long to 28" x 9 lb 15 oz. The trout were all measured, and those over the size limit were also weighed. In addition, 111 were finclipped, 181 tagged, and the remainder, which consisted of young of the year were unmarked.

Of the trout handled, 110 or 21.9% were over the size limit of 12" then in force. Table 1 shows the size and condition of the trout over 12" long. Of this sample, only 9.1% were below the average condition factor of 40, a further 3.6% had a condition factor of 40, and the remaining 87.3% had a condition factor above 40.

Figure 1 shows the length frequency distribution of the fish sampled. As is usual, the greatest number of the population consists of 0 yr + and 1 yr + fish, up to about 6½" long, with a few 2 yr + up to 11" long. However, there is a gap between fish of this size and those of approximately 4 yrs, about 15" long, which suggests that most of the young fish migrate downstream and out of the Whitestone. This theory is supported by the fact that numbers of small fish could be caught in the Long Valley-Blue Cliffs area in mid-summer, and that they were then found only in the lower reaches during March.

Although there is no direct supporting evidence, it is probable that the resident population of large fish is maintained through the return of fish that had migrated from the Whitestone as 0 yr + and 1 yr olds. A total of 292 young trout were marked either by finclipping or tagging, but none have been recovered as adults. If any of these fish have returned and remained in the river, sampling this summer (1973-4) may reveal their presence. However, the total sample marked may be inadequate to cover natural mortality before maturity.

The distribution of large fish in the Whitestone appears to be governed by the availability of suitable cover. This may take the form of deep holes, undercut or fallen banks, and in the lower Whitestone, heaps of large boulders dumped in the river for bank protection. These boulder heaps are particularly valuable during summer low water conditions. During electric fishing under these conditions, six large trout were taken from the boulder heap shown in Photo I. This, and Photo II illustrate the valuable holding areas for large trout created by the dumping of boulders. Photo III shows a trout of about average size for the Whitestone, which was salvaged during the drought of 1970-1.

Tag Returns—of the 181 trout tagged, to date only 15 (8.75%) have been recovered. Of these recoveries, 12 were made by electric fishing, and three by angling. All except one were made from the locality where they were tagged, the exception being an angler caught fish which had moved 3 miles upstream in about three months. As far as is known, no other tagged fish have been recovered by anglers. Six of the fish recovered were at liberty for over one year, the remainder for periods of from three to seven months.

Spawning—Spawning surveys were carried out on the Whitestone river from the mouth to the confluence with the L. Echo outlet stream. These surveys were made in 1967, 68, 70 and 72. Not every section of the river was covered each year. A spawning survey was also carried out by the Technical Field Service on 29.8.64. On this survey 5 miles of the river was covered, 3 miles of the lower reaches from the confluence with Flaxy Creek, and 2 miles in the vicinity of Prospect Flat. On this survey a total of 21 redds, all located near the mouth of the river were found. A further 34 redds were seen in the first 1½ miles of Flaxy Creek. This creek has since been excavated. The T.F.S. report comments that there had been recent flooding in the Whitestone, and bad scouring in the upper reaches. Visibility was also poor due to strong winds, and this would make the spotting of redds difficult.

Photo I

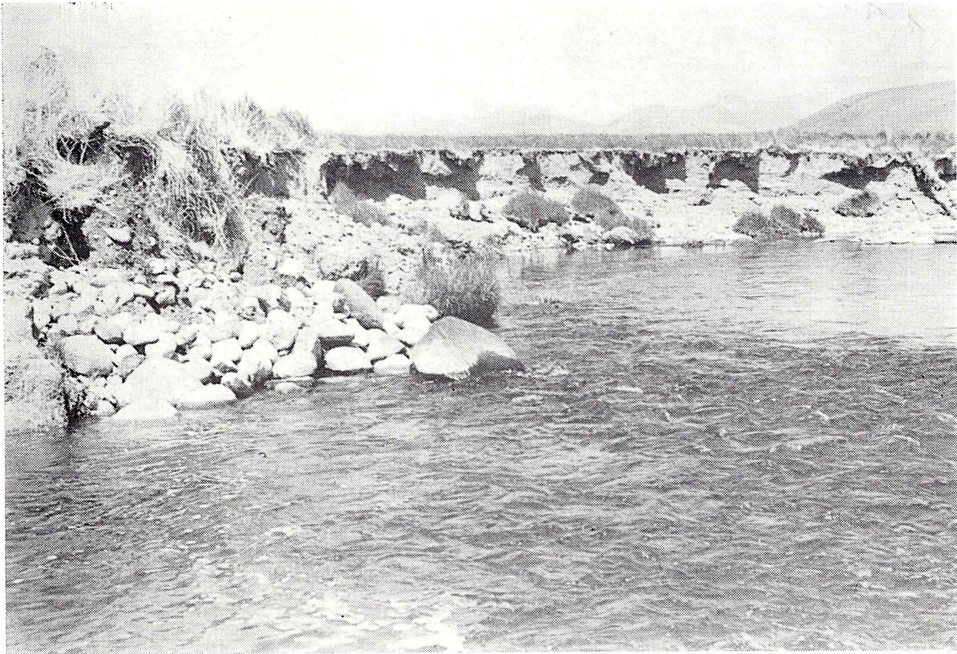
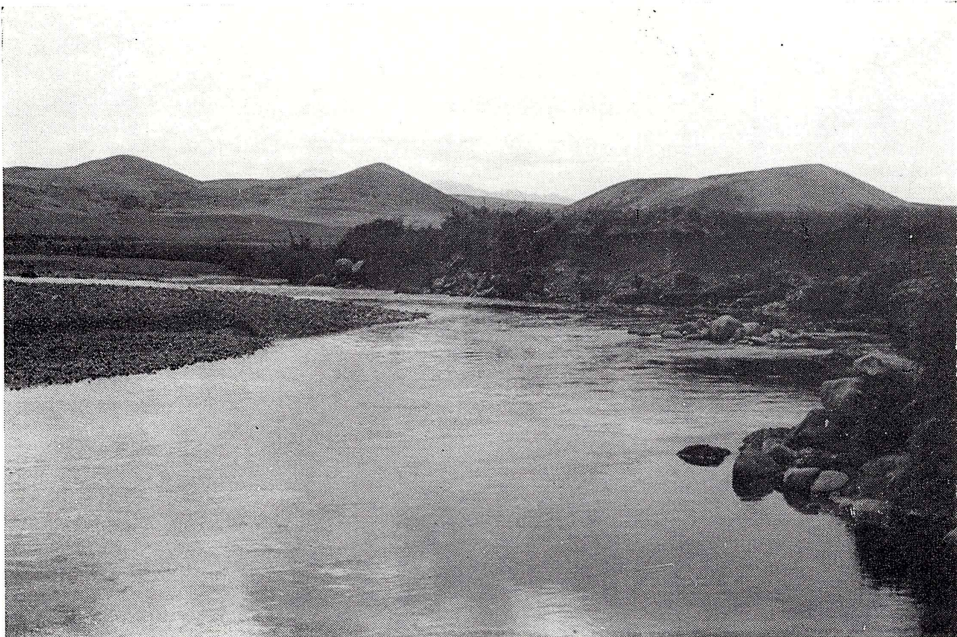
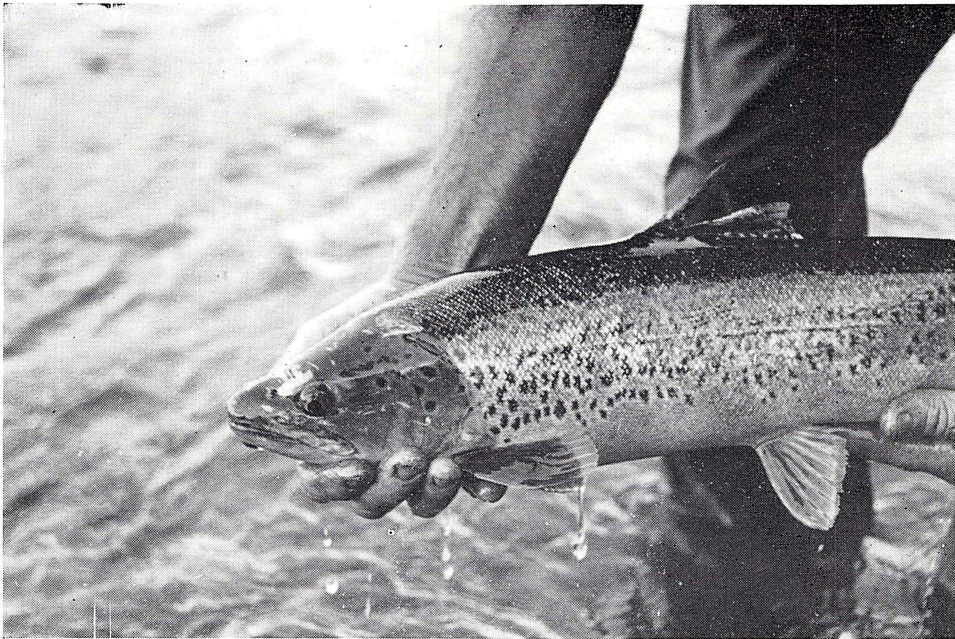


Photo II

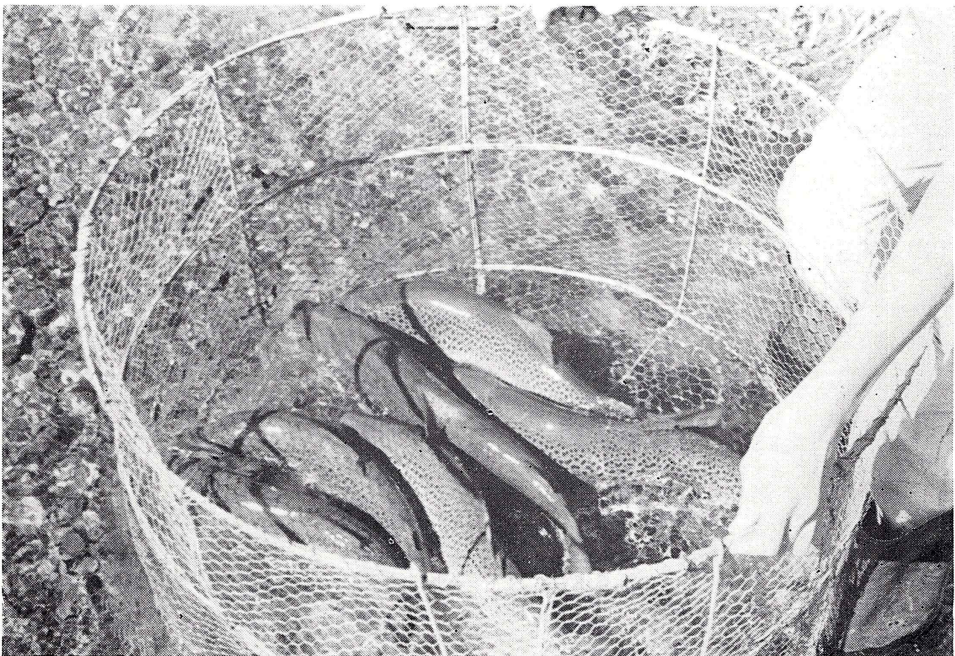


Illustrating valuable cover for large trout created by rock dumping.

Photo III



A typical Whitestone Trout salvaged during the drought of 1970-71



Good specimens of mature Brown Trout salvaged from the Whitestone river

The spawning surveys carried out during this investigation indicate that the lower $1\frac{1}{2}$ miles of the river, and the area from above the Te Anau highway to Moat Creek are the main spawning localities. This part of the river is well within the Lands and Survey development block. Approximately $18\frac{1}{2}$ miles of the river were covered during spawning surveys, and the various sections are shown on the attached map. Table II shows the results of the surveys.

(c) Bottom Fauna—No bottom fauna samples were taken during this survey. However, unpublished data on samples collected by the Technical Field Service between February 1962 and October 1966 are available. The samples were collected from seven stations from the Manapouri road bridge to just below Echo Creek. These samples show an adequate bottom fauna population, composed mainly of various species of mayfly nymph, addis and parnid beetle larvae.

The addition of nutrients to the river as a result of increased farming activities, and the resultant increased algal growth, plus the movement of fine shingle, may have a deleterious effect on bottom fauna numbers.

(d) Regulations: Prior to 1955 the regulations allowed any legal bait and a bag limit of 10 fish per day in the Whitestone and its tributaries. However, because of the numbers of large fish that were taken on the worm in the early months of the season, the regulations were changed from time to time in an attempt to provide continuity of angling throughout the season. In 1955, regulations were gazetted that prohibited the taking of more than 4 fish per day above the Manapouri road. In 1963, a further modification prohibited fishing in the Whitestone with any method other than artificial fly; a further modification in 1965 permitted the use of natural fly. In 1966 the 4 bag limit was extended to include the whole river and tributaries. In 1972, a further modification to the regulations was gazetted to allow the use of any artificial bait. At present, the regulations allow a bag limit of 4 fish per day over the whole of the Whitestone and its tributaries, and the use of any artificial bait only.

(e) Angling—Unfortunately, there are no figures available on the number of anglers fishing the Whitestone in a season, or on the success of their efforts. Compared with the more popular waters in the Southland district, angling pressure is very light. This is indicated by ranging patrols, and the lack of tag returns by anglers in spite of publicity in the 1970 Annual Report.

DISCUSSION:

The resident trout population of the Whitestone consists of a relatively small number of large, well conditioned fish. The presence of these trout depends to a large extent on the availability of suitable cover. Juvenile trout migrate downstream to the Mararoa river, and may return later as mature fish during the spawning season. Some of the spawning migrants probably are recruited to the resident population. Spawning takes place throughout the whole of the river below the Echo lake outlet creek, but mainly from about 1 mile above the Te Anau highway to Moat creek, and from the mouth to 1 mile above the Manapouri road bridge.

Agricultural development and increased stocking of the valley have affected water quality, especially in the lower reaches, increased instability of the banks and bed in many localities, and lowered the minimum summer water levels. There has also been improved access to the river, and where rock dumping for bank protection has taken place, there has been an increase in holding water for large trout. The establishment of bern areas on the river bank should be of benefit, provided they are kept free of stock. Observations show that this is not always the case.

Although there is no direct evidence, angling pressure is light, and few fish would be caught during any one season. The present bag limit of four fish per day would have little effect in reducing the catch because of light angling pressure and the difficulty of catching trout in this stream. However, during high water in the early part of the season, a 4 bag limit would be appropriate. The same comment would also apply to the restriction on natural bait.

Numbers and species composition of the bottom fauna may be affected by various factors as a result of agricultural development. The results obtained during this survey indicate the deterioration of trout habitat which will result in the deterioration of the fishery unless remedial steps are taken.

RECOMMENDATIONS:

- (1) It is recommended that the present angling restrictions be maintained.
- (2) That further attempts be made to ascertain whether or not juvenile migrants return as spawning fish.
- (3) That further checks be made on the bottom fauna.
- (4) That the Regional Water Board be approached in an attempt to prevent further unnecessary channelling of tributary streams and draining of swamps, and to cease the stocking of berm areas by the Lands and Survey Dept.
- (5) In view of the dependence of large trout on adequate cover, the feasibility of rock dumping in suitable areas be investigated.

ACKNOWLEDGEMENTS:

On behalf of all field staff engaged in this investigation, I wish to acknowledge invaluable help in the field given by Mr Colin Burgess, of Birchwood, and Mr Ron Horrell, of Ardlussa.

REFERENCES:

Allen K. R. *"Effect of Land Development on Stream Bottom Faunas"* Proc. N.Z. Ecol. Soc. No. 7, 1960. Pp 20-1.
 Galloway J. & Cudby E. *Technical Field Service report No. 61.*
 Boud R. & Cudby E. *Unpublished Technical Field Service data, on bottom fauna. Whitestone river, 1962 to 1966.*

R. BOUD,
Field Officer.

TABLE I - WHITESTONE RIVER
Length, weight and condition factor of trout over 12"

Number	Length		Weight		Condition Factor	
	Range	Average	Range	Average	Range	Average
110	15½"-28"	21.1"	1 lb 10 oz- 9 lb 15 oz	4 lb 5 oz	32-57	46.3

Figure 1 — LENGTH FREQUENCY, WHITESTONE RIVER

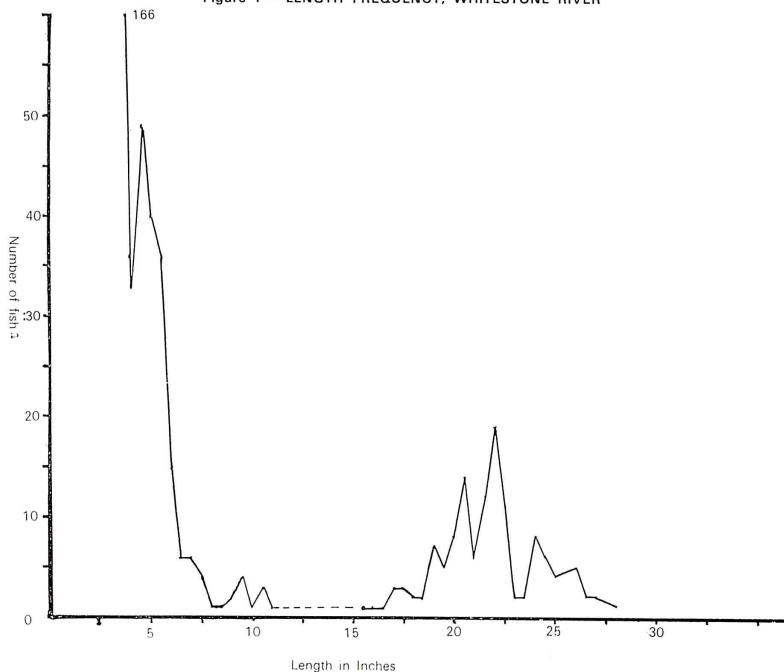


TABLE II — WHITESTONE RIVER SPAWNING SURVEYS

Section	Length	Date	No. Fish	No. Redds
mouth to 1 mile above Manapouri road	1 $\frac{1}{4}$ miles	15-6-67	18	15
		23-6-68	31	26
		6-70	35	8
Kakapo stream to Te Anau road	1 $\frac{1}{2}$ miles	14-6-67	no survey	
		7-70		
		6-72	2	1
Te Anau road to pump shed	2 $\frac{1}{2}$ miles	14-6-67*	6	6
		7-70	0	20
		6-72	7	5
pump shed to hay shed	2 $\frac{1}{2}$ miles	7-70	8	26
		6-72	13	22
Hay shed to Moat creek	3 $\frac{1}{2}$ miles	7-70	10	16
		6-72	14	13
Moat creek to Prospect station	2 $\frac{1}{2}$ miles	14-6-67	9	5
		7-70	3	2
Prospect station to Echo creek	5 miles	19-7-67	4	4
		6-72	4	5

*To 1 mile above Te Anau highway.

Pourakino River Survey

This survey has been done in conjunction with investigations which are being carried out by the Ministry of Agriculture and Fisheries into the effect of the beech utilisation scheme on streams. The objective of this survey was to determine, if possible, the effect of the coarse granite sand common in the Longwood range, on the spawning of trout in the Pourakino river system. At the same time, the presence and effect of log jams, the various species of bottom invertebrates present and the sources of the sand were to be noted.

The preliminary step was to locate spawning areas in the Pourakino watershed. After this, redds were to be sampled as described by Hobbs (1), in the following situations,

- (a) Unlogged areas
- (b) Logged with buffer strips
- (c) Logged without buffer strips

Results:

(1) **Spawning survey**—The Pourakino river and its main tributaries were surveyed during June and July 1973 in the following areas:
Pourakino river from Mill Road Bridge to Gill creek
Granity creek from Pourakino confluence to first forks
Gorge creek from road bridge to limit of spawning
Gill creek from Pourakino confluence to gorge

Table I shows the numbers of redds counted in each part of the watershed surveyed.

Table I—Pourakino Spawning Survey

Gill Creek	20.6.73	200 yards	3 redds	
Granity Creek	22.6.73	$\frac{3}{4}$ mile	10 redds	
Gorge Creek	17.7.73	1 $\frac{1}{2}$ miles	23 redds	
Pourakino River	22.6.73	2 $\frac{1}{2}$ miles	35 redds	Granity Creek—Mill Road
Pourakino River	3.7.73	1 $\frac{1}{2}$ miles	52 redds	Mill Road—Gill Creek

Because of the nature of the beds of the streams in the Pourakino river system which are generally stoney with a considerable amount of sand in most localities, suitable spawning gravels are not plentiful. This is particularly the case in the tributary streams. Consequently, there is no well defined area where large numbers of trout congregate to spawn, but redds are scattered in small numbers throughout the spawning streams wherever a suitable patch of gravel occurs. Therefore no more than 8 redds were counted in any one area. A further consequence of the lack of spawning gravel is the frequency of superimposition of redds, up to 100% in some cases, but probably not less than an average of 50% in the main river. There is less superimposition in the tributary streams, where redds often occur singly. According to Hobbs (2), superimposition of redds can cause losses of up to 31% of ova in the redds on which others are constructed.

Areas of apparently suitable gravel were seen which were not utilised by spawning fish. Examination of these areas usually revealed a substantial proportion of granite sand below the surface layer, which would reduce the flow of oxygenated water to the ova, and also reduce the survival of fry after hatching. The presence of from 12% to 61% by volume of sand in gravel would prevent the survival of from 2% to 96% of fry after hatching. (3).

No particular count was made of the numbers of fish seen during the spawning survey, but no more than 30 were noted. The largest of these would weigh an estimated 5 lbs in good condition, with an average estimated weight of 2 lbs for those seen.

(2) Red Sampling—Unfortunately, none of the conditions under which redds were to be sampled occur as yet in the Pourakino watershed where spawning takes place, except unlogged areas. It was therefore considered that sampling of redds was not worthwhile at this stage.

(3) Bottom Fauna—Qualitative samples only of bottom Fauna were taken, and a normal association of animals was found. The dominant animals seen were the nymph of the stonefly *Zelandoperla* and of the mayfly *Deliatidium*, and the larva of the caddis *Helicopsyche*. A complete list of bottom animals seen is appended.

(4) Sand—Upstream from the bridge over the Ermedale—Pourakino Valley Road, granite sand may compose up to 30% to 40% of the bed of the stream, with some localised areas where the percentage is much higher. Overall, this upper section of the stream probably contains an average of 15% to 20% of sand. This material is thought to be due almost entirely to natural erosion, as nowhere was sand found in a stream where it could have come directly from logging or roading activity. Several areas are known where large quantities of granite sand have been exposed and are being washed into gullies and creeks, but these areas are all some distance from the streams where spawning takes place. It is doubtful if present activity is adding any appreciable quantity of sand to the main streams in the Pourakino river system.

(5) Log Jams—During the survey, only one major log jam was seen. This was in Gorge creek, about $\frac{1}{4}$ mile upstream from the first fork, and appears to be a natural jam, i.e. none of the logs have been cut. Although substantial enough to dam the stream for about 2 chain, the obstruction does not prevent the passage of trout, as redds were found upstream from it.

DISCUSSION :

The officer in charge of the Longwood forest has informed me that to his knowledge there are as yet no definite plans for proceeding with the beech scheme in the Longwoods. He was unable to tell me which areas are to be felled first, or whether or not buffer strips along stream banks are to be left. He pointed out that it may be virtually impossible to preserve buffer strips during the burning off of felled bush.

The present clear felling and planting of pinus east of the Pourakino river has been in operation for some years, and was planned some time before the beech scheme. This operation is not affecting the Pourakino as far as is known. The N.Z.F.S. is aware of the possibility of sand entering streams as a result of roading and logging, and that this can upset the ecology of the stream. I was shown a publication describing methods of preventing this from happening.

CONCLUSIONS AND RECOMMENDATIONS:

From the above the following conclusions have been drawn.

- (1) The Pourakino watershed provides only a limited amount of spawning gravel.

- (2) The small areas of gravel available result in superimposition of redds, with a possible loss of up to 31% of ova where superimposition takes place.
- (3) A considerable amount of coarse granite sand which occurs naturally in the stream, limits the use of otherwise suitable spawning gravel.
- (4) Any further increase in the amount of sand in the streams, which may result from logging and roading, may further reduce spawning areas.
- (5) A normal population of bottom fauna is present in the Pourakino river system.

It is recommended that the N.Z.F.S. be asked to ensure that no sand enters the main stream as a result of logging activities, and that a further survey, including redd sampling if necessary, be carried out if the beech utilisation scheme is implemented.

R. BOUD

Field Officer.

REFERENCES:

- (1) Hobbs, D. F. "*Natural Reproduction of Trout in N.Z.*" N.Z. Marine Dept, Fisheries Bulletin No. 8.
- (2) Hobbs, D. F. "*Trout Fisheries in N.Z.*" N.Z. Marine Dept. Fisheries Bulletin No. 9, p. 75.
- (3) Bjorn, T. C. "*Survival and Emergence of Trout and Salmon Fry in Various Gravel-sand Mixtures*".

APPENDIX I

List of Bottom Fauna found in Pourakino River System 1973.

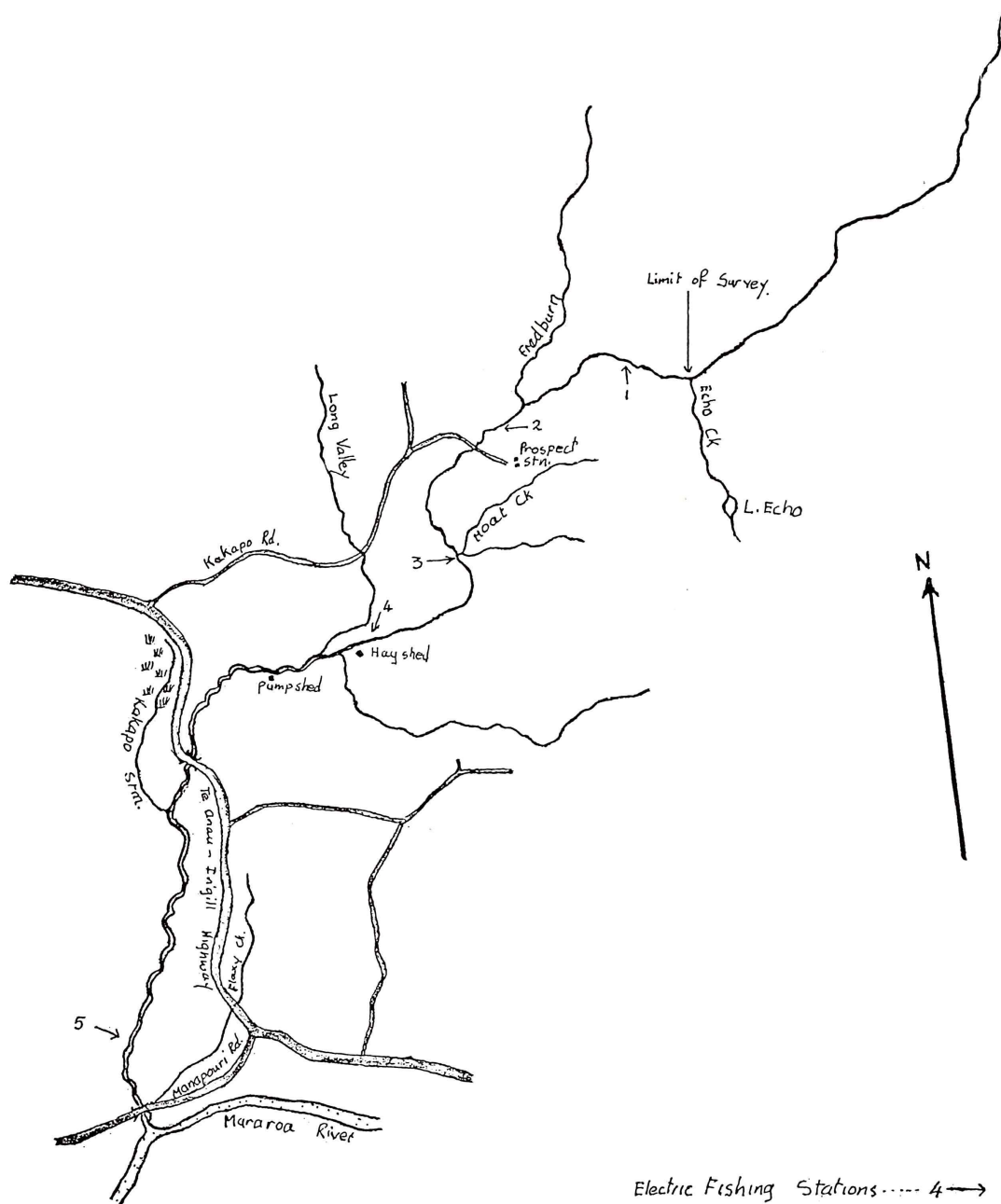
Ephemeroptera	Deliatidium Coloruriscus
Trichoptera	Helicopsyche Olinga Hydropsyche Hydrobiosis Oxyethira
Plecoptera	Zelandoperla
Diptera	Austrosimulium Blepharoceridae spp.
Mollusca	Potamopyrgus



Mataura River at Garston after Willow control



"Bet you have a hole in your boots . . ."



SOUTHLAND ACCLIMATISATION DISTRICT

Southland Acclimatisation Society Huts

- 1.—WAIRAKI
- 2.—NOKOMAI or FIERI CREEK
- 3.—WAIU
- 4.—WAITUNA
- 5.—CATTLE FLAT
- 6.—TE ANAU
- 7.—CENTRE HILL
- 8.—MARAROA STATION
- 9.—MARAROA MOUTH
- 10.—The Deerstalkers' Hut at Lake Mavora
- 11.—LILLBURN

- 1.—WAIRAKI
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FIERY CREEK
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MOUTH
- 10.—The Deerstalkers'
Hut at Lake Mavora
- 11.—LILLBURN

Game

Game Committee Report

An extract from the Internal Affairs Department annual report on the New Zealand waterfowl shooting diary scheme for 1972 summed up the position in Southland as follows.

"Another good season for these hunters; they obtained their highest opening weekend and whole season bag that we have recorded since the diary scheme began in 1968".

Interim figures for the 1973 season indicate that this general upward trend is continuing.

During the past 40 years I have seen a general tightening of game shooting restrictions, mainly in respect of bag limits and length of season. This last season saw requests being made and granted to have the season extended. In these circumstances hunters can feel well pleased that the Mallard duck population in the district is in such good heart, and with careful management, it is hoped it will stay in this condition.

Crop Damage by Wild Duck:

While commenting on the provincial game bird population, I feel that some mention should be made regarding damage to farm crops by wild duck as this was a factor associated with the extended season. A summary of the senior field officer's report on this subject is as follows:

"Official complaints of crop damage increased from 32 last year to 101 in 1973. More than half the complaints were in respect of barley even though relatively small acreages of this crop are grown. Damage to wheat crops was reported only 14 times.

The increase in complaints appears to be directly related to the increase in the Mallard population.

Every effort was made by all members of the field staff to deal promptly with reports of damage. Additional gas scare guns were purchased and we had ten of these in constant use during the peak periods. It was necessary to use our permit to destroy in one or two very difficult situations. A total of 55 birds were killed and given to charity. Written permits were issued to farmers to do their own disturbing on twelve occasions. No other private killing of wild duck was legal.

It is alleged by some that there are too many refuge areas and that this is the main cause of the trouble. This may be true to some extent, but there are reasons for believing this may not be so, especially in areas away from the coast. Revocation of all refuge areas would probably result in a slightly higher opening day kill, but perhaps only slightly so. It would certainly result in a general exodus of unshot birds to large coastal waters where refuge was available. This would result in a marked fall off in evening flight shooting in inland areas and very likely a greatly reduced overall kill. There are 22 official refuges in the district only a few of which hold a significant number of birds. Six have been revoked in recent years. If refuges are a problem, the main trouble lies in the private sector where there are at least 55 protected areas. Other than by persuasion, these are outside our control.

It is clear that the wild duck population is extremely high, following a very successful breeding season. It is also fully appreciated that game bird numbers fluctuate for reasons not always apparent, and that the situation in Southland may be very different in future years. In the meantime it is apparent that an increased kill is necessary, safe and desirable. The best way to achieve this is to adjust shooting restrictions so as to permit a larger kill. Since the bulk of the total annual

kill occurs on the opening weekend and shooter effort, falls away steeply thereafter, it seems logical to arrange the season in two parts with two opening weekends.

The recommendations were that the Society take immediate steps to have the 1973 season reopened on the 30 June for a short period, and that consideration be given to having an experimental split season in 1974, starting with an opening weekend in mid March followed by a normal May season".

The first recommendation was adopted by Council and on the basis of the information presented, the Minister of Internal Affairs approved an extended season of nine days from 30 June to 8 July. A proposal to have a special February season in 1974 was rejected by Council and the decision on what shooting conditions for next season will be has been deferred until an assessment of the current breeding season is made. The following is a report prepared by the Senior Field Officer Mr R. Sutton on a survey of duck shooters following the closure of the 1973 extended season.

DUCKSHOOTERS SURVEY – EXTENDED SEASON – 1973

The following is a report on a survey of duck shooting results, following the conclusion of the extension of the 1973 game season (30 June – 8 July inclusive).

Type of Survey:

The survey consisted of interviews with shooters by five members of the field staff over the period 9 July to 20 July 1973, with a view to obtaining information on various aspects of the extended season. The opportunity was also taken to collect information on shooting success during the normal May season. Only information which was known to be reliable and accurate was accepted for inclusion in the analysis. A total of 427 shooters were included in the analysis.

The important question of whether the shooters interviewed were a random sample or not must be considered. While it is true that they were not interviewed at random (i.e. every second or third shooter) it is felt that the sample is a fairly representative one. Shooters were interviewed as and where we found them, in factories, garages, offices, on farms, roadsides and in homes. Successful shooters were not particularly looked for and as the data shows, 21.5% of the sample shot only one or less birds during the extended season.

Results of the analysis are as follows:

Extended Season:

Total guns sampled	...	...	...	...	...	427	
Licence holders	...	...	...	...	...	343	
Occupier shooters	...	...	...	...	...	84	19.7%
Opening weekend bag	...	...	...	...	...	1443	55.9%
Rest of season bag	...	...	...	...	...	1137	44.1%
Total not retrieved	...	...	...	...	...	229	8.1%
Total bag (less not retrieved)	...	...	...	...	...	2580	
Mallard	...	...	...	...	...	2515	97.5%
Grey	...	...	...	...	...	63	2.5%
Shoveler	...	...	...	...	...	2	
Average bag per gun	...	...	...	...	...	6.04	
Endorsements issued	...	...	...	...	...	2725	
Estimated occupier shooters	...	...	...	...	...	681	(1 to 4 ratio)
Estimated total district bag	...	...	...	...	...	20572	
Shot on opening weekend only	...	...	...	...	...	97	22.7%
No success at all	...	...	...	...	...	53	12.4%
Shot one duck only	...	...	...	...	...	39	9.1%
Highest individual bag	...	...	...	...	...	36	

Normal May Season 1973

Total guns sampled	...	...	...	...	...	382
Total bag	...	...	...	...	...	9594
Average bag per gun	...	...	...	...	...	25.1
Estimated total shooters (1973 sales plus occupiers at 1 to 4 ratio)	...	...	...	...	...	4700
Estimated total district bag	...	...	...	...	...	117970

Shooter Response:

In general terms the extension to the season appears to have been successful. Favourable shooting weather with little frosty weather generally prevailed.

There were several prominent features to this extended season, the first of which was the response by shooters. An estimated 3432 shooters or about 75% of the normal season's total turned out. This must be taken as some evidence that split or staggered seasons are likely to be effective and acceptable to the shooting fraternity. Only odd shooters expressed dissatisfaction with this late extension to the season.

Shooter Effort:

Another feature of the extended season was the higher than usual kill (44.1%) after the opening weekend. A higher percentage of shooters than usual continued to hunt throughout the season. Good evening flight shooting and stream and river shooting was a notable feature. Evening flights commenced earlier and in a better shooting light and birds seemed to be less wary.

Occupier Shooters:

During the survey an attempt was made to assess the number of shooters who shoot on their own land and who are not required to purchase a shooting licence. As expected some land occupiers turned out to be licence holders too, but in spite of this the unexpectedly high figure, 19.7% of the sample interviewed were non licence holders.

This may be a very inaccurate estimate but to date it is the first and only indication of what the total may be. On the other hand, if the estimate is reasonably accurate, then it appears that on last year's licence sales we have about 897 occupier shooters in the district. This is almost double that allowed for in previous estimates of total kills and populations.

Shooter Success:

Shooter success was varied. 53 or 12.4% of those interviewed had no success at all. Two youthful shooters had personal bags of 25 and 36 birds respectively for the nine day season. The average bag was 6.04 birds per gun or about 25% of the normal season's kill, and from this we calculate that the total extended season bag was 20,572. To this we add an additional 8.1% for birds put down and not retrieved.

The figure of 8.1% not retrieved will be higher than usual due to the fact that a party of four shooters included in the sample lost an astonishing sixteen birds each down the flooded Oreti river on the opening weekend. Their retrieving dog had been accidentally killed the previous week.

Species Shot:

As was hoped for, a high percentage (97.5%) of the bag was Mallard duck, 2.5% were Grey duck. Two illegally shot shoveler were recorded, one of which was a valuable band and nasal saddle return.

It is interesting to note that percentage of Greys shot is much lower than the 8% shown in the National Diary analysis. We tend to think our figure is probably more accurate due to the fact that information was closely screened in this

interview survey. The problem of bird identification is very apparent as there were instances of fair numbers of Greys reported shot in areas where they are not prevalent or do not occur.

Condition of Birds:

Condition of ducks shot was also variable, but generally ranged from just fair to excellent. Females were in a noticeably better condition than males. We received no reports of females carrying well developed eggs.

Normal May Season:

Among the shooters interviewed, 382 were able to give accurate totals of ducks shot during the May season. Their average of 25.1 per gun is in close agreement with the average recorded the last two years in the National Diary analysis. It is worth recording that many shooters expressed the view that they had not been as successful this May season as usual. Some had said it had been a lot poorer.

Conclusion:

It appears that the extension to the 1973 shooting season has been successful and effective in reducing Mallard duck numbers. Shooter response and co-operation has been good.

Remaining birds for breeding stock appears to be adequate and it will be interesting to study the average brood size in the coming breeding season.

I feel that this has been an interesting and useful exercise in game management and that it shows that a split season can be effective where an increased kill is shown to be desirable or necessary. The concept appears to be acceptable to shooters. It also shows that a high degree of shooter participation and recreational activity can be incorporated in such an exercise.

Yours faithfully,

R. R. SUTTON
Senior Field Officer.

Black Swan:

During the past two game seasons the committee did not make too many new friends among the swan shooters by imposing total restrictions on taking these birds. However I now feel that the committee's decision is being regarded in a new light and credit is being given to the effort to conserve and if possible increase the swan population in the district. The Black Swan population appears to hang in a very slender balance. It is not generally known that the great "Wahine Storm" very seriously affected the New Zealand swan population, especially at Lake Ellesmere where countless thousands were reduced to a comparative handfull.

The local population is still under one thousand and local breeding last season produced a meagre increase of well under 100 young reared.

Wetlands:

The game committee is still actively concerned with the preservation and creation of wetland areas. In pursuing this policy negotiations are currently under way in respect of several areas. These include possible additions to the already established Waituna Wetland reserve and a further area of about 600 acres of peat swamp near Drummond. In collaboration with the Southland Catchment Board the "Dawson City" swamp in northern Southland has been developed along the same lines as the Lagoon Creek flood retention structure and several other areas with development potential in the Mararoa, Oreti and Hamilton Burn catchments are at present under consideration.

Pond building has continued during the year. Eleven new ponds with a total water area of 4 $\frac{3}{4}$ acres were built under the Society's subsidy scheme. Numerous other sites were surveyed and more work is pending. Advice on the maintenance of existing habitat has been freely given on request. The principal ponding project for the year was that undertaken at Castle Downs on a forestry area owned by the Woman's Division of Federated Farmers. A group of six ponds with a water area of about six acres has been constructed at a cost of approximately \$360. By agreement this area is to be managed by the Society and shooting stands which will be established will be allocated in the usual democratic manner.

Pheasants:

It is with an amount of satisfaction that we note that shooters are making full use of pheasant eggs which we produce at Murihiku game farm for home hatching and that as a result some enjoyable hunting is being obtained.

Stock birds produced 1,065 eggs which were distributed to 28 private breeders. From these 613 were hatched and 396 birds were finally reared. All birds were put out to the gun under closely controlled circumstances and a survey showed that 293 or 74% were recovered.

In our last annual report we quoted scientific evidence which showed that only about 23.3% of hand reared pheasants are likely to be recovered by shooters and it is interesting to compare this with a local example recorded this season. In this case a group of fifteen experienced shooters assisted by twelve better than average gun dogs, released 164 hand reared pheasants and recovered a total of 101 birds or 61.5%. These birds were released in three batches over the season. Releases were made in the mornings and hunting took place in the afternoon of the same day under carefully managed conditions. It can be seen that even under these circumstances the percentage of birds returned was much less than would be expected. With mass releases of birds well prior to hunting and under circumstances which are of necessity, loosely controlled under a general district scheme, the figure of 23.3% returned is most likely fairly realistic.

Paradise Duck

Very careful consideration was given to the question of whether Paradise duck should be returned to the game list in Southland for the 1973 shooting season. The decision was finally taken to permit a limited (two day) season with a bag limit of two birds per day in that part of the district which lies generally north of the Takitimu Mountains and the Lumsden—Centre Hill highway.

After such a long conservation programme which commenced in 1962, this was not an easy decision to make and Council were by no means unanimous. Not all shooters in this area showed a desire to hunt Paradise duck and it is estimated that only a token number were shot. Shooters appeared to be generally co-operative, but we regret to report that some were not. Those who were apprehended for illegal shooting were dealt with accordingly.

Waterfowl Banding:

The Society's field staff were again substantially involved in a waterfowl banding programme which is part of a national research scheme. Over the period from December to March a total of 3,080 wild duck of four species were caught and banded. Of these, 1,500 were Mallard and Grey ducks banded at Thomson's Crossing and Waituna Lagoon as part of the pond feeding experiment.

The Paradise duck banding has continued with 1,000 adults being banded in northern Southland during January. More important was the banding of a further 500 flightless juvenile Paradise again this year.

Following on from last year's pioneering work with Shoveler duck banding, the field staff banded a further sample of 80 birds during last breeding and moulting season. Due to the extreme difficulty of trapping Shoveler duck the total banded over the two years is only 153 birds but in spite of this the information on movement which has come to hand adds greatly to our scanty knowledge of the species.

Some of the more spectacular recoveries are shown on the adjoining map.

Pond Feeding:

This shooting season marked the end of the six year pond feeding experiment. A preliminary report prepared by Mr Caithness and considered at the September meeting of the South Island Council meeting follows.

THE SOUTHLAND POND FEEDING EXPERIMENT

The 1973 game season marked the end of a six-year pond feeding experiment in Southland.

The pro's and con's of pond feeding have been well debated elsewhere. Here, we will show the facts collected over the past six years and discuss their significance.

In all figures presented and discussed here we are dealing entirely with Mallard and Grey duck only, other species of waterfowl are not thought to be too influenced by pond feeding.

Figure 1 includes all data collected in Southland over the six year period including those who took part in the actual pond feeding experiment.

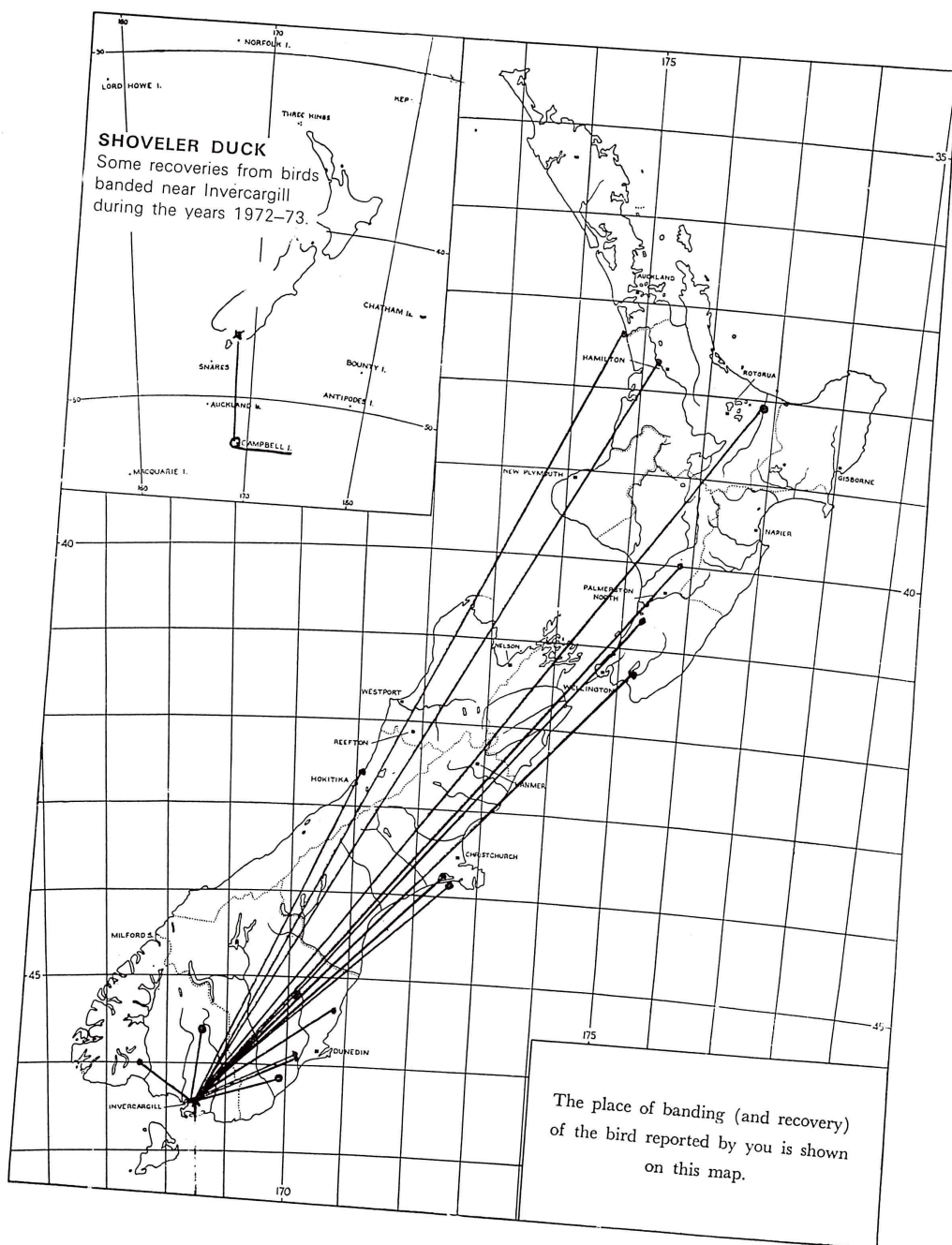
The figure is divided into the three years of data collected before feeding (1968, 1969, 1970) and the three years after feeding (1971, 1972, 1973). From the graph-line you can see that the hunters have been enjoying very good and steadily increasing bags over the entire period. In fact, their 1973 bag of Grey and Mallard is 84% better than it was in 1968.

It is obvious then, that there is an increasing duck population in Southland.

For the purpose of the pond feeding experiment and so that valid comparisons could be made between the success of hunters who fed and those who did not both before and after feeding, we enlisted a set of co-operators who were adjudged capable and willing to keep a high quality hunting diary over the six year period. Some unfortunately fell by the wayside and the final analysis, we finished up with rather more hunters feeding, than not feeding. We consider however, that the data obtained are reliable and convey the events accurately.

In Figure 2 the graphline shows that prior to feeding, those hunters who never intended to feed enjoyed considerably better hunting than those who intended to feed when given the opportunity. In fact, they averaged four birds per season better (20 as against 16). On the right-hand side of the graph, with the exception of 1972, the situation was reversed. Now, the not fed sample are getting the same number of birds per season as the fed sample (24 each).

In other words the hunters who *did not* feed had an average bag increase of 15% between the two periods, while those who *did* feed had a bag increase of 44%.



One important question asked before the experiment begun, was, if pond feeding did in fact substantially increase the bag would the hunters take advantage of this and spend more time hunting? Data in Figure 3 show they did not. In fact, the graph line shows with one exception (1972) when the hunting effort was the same for both samples, that those who *never fed* hunted considerably harder than those who *did feed*. When the mean hunting effort for the two samples of hunters in the before and after feeding periods are compared you can see that those who fed only increased their effort by 0.3 of a day over the whole season, while those who did not feed increased their effort by almost one day.

Data in Figure 4 shows that the mean number of birds per gun per day for those who *did not* feed remained about the same for both periods, while those who did feed, increased their daily bag by about one bird.

Conclusions:

There is no doubt that pond feeding did increase the harvest and probably gave a better distribution of the hunting but, the hunters in general did not really take advantage of any of the apparent benefits that feeding gave by virtue of the fact that, the birds came to them, rather than working even a little harder at their sport.

We were concerned that Grey duck may suffer even higher losses than they already sustain if pond feeding were allowed, in Southland this did not occur. The average bag per gun of Grey and Mallard over the six years have been:

	1968	1969	1970	1971	1972	1973
Grey	2.3	3.4	2.8	1.8	2.1	2.0
Mallard	12.3	14.5	17.3	21.1	21.9	24.9

If any thing the Grey duck bag has decreased.

When we set out this experiment, we did not realize that the Mallard population in Southland was increasing at such a rate as it obviously is. For this reason, some of the findings should be viewed cautiously. It seems, however, that in Southland those who fed increased their season's bag by 29% on average over the three year feeding period compared to the non feeding period. This is in addition to the 15% increase they would have had (because of the increasing duck population) without bothering to feed.

We consider that if pond feeding increases the harvest as dramatically elsewhere as it has in Southland, then, most societies should look carefully at their duck population and decide whether or not it can stand an increased harvest of this magnitude before introducing pond feeding in their district.

Summary:

- (1) The Mallard duck population in Southland appears to be increasing rapidly.
- (2) Pond feeding resulted in an increase of 29% in the season's bag for those who fed in addition to the 15% increase obtained by those who did not feed.
- (3) Grey duck harvest figures did not increase during the pond feeding period.

T. A. CAITHNESS,
Scientist, Wildlife.

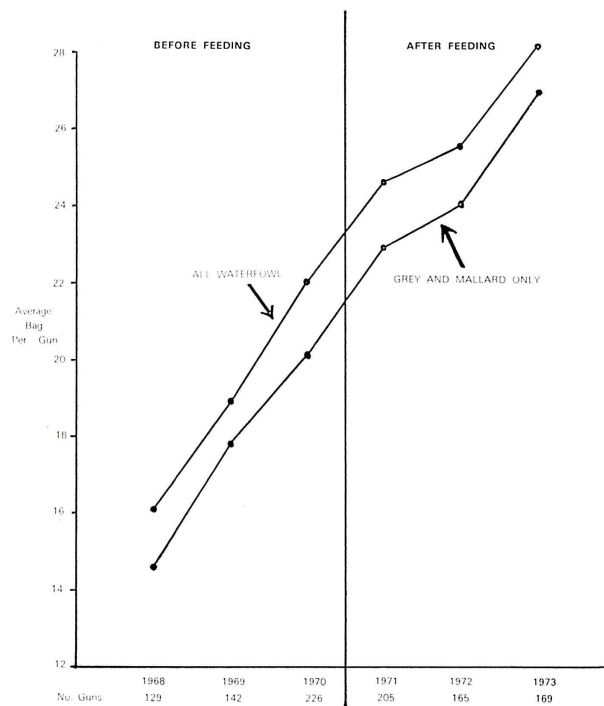


Figure 1.—All Southland data showing the steady increase in average bags of Mallard and grey ducks over the past six game seasons.

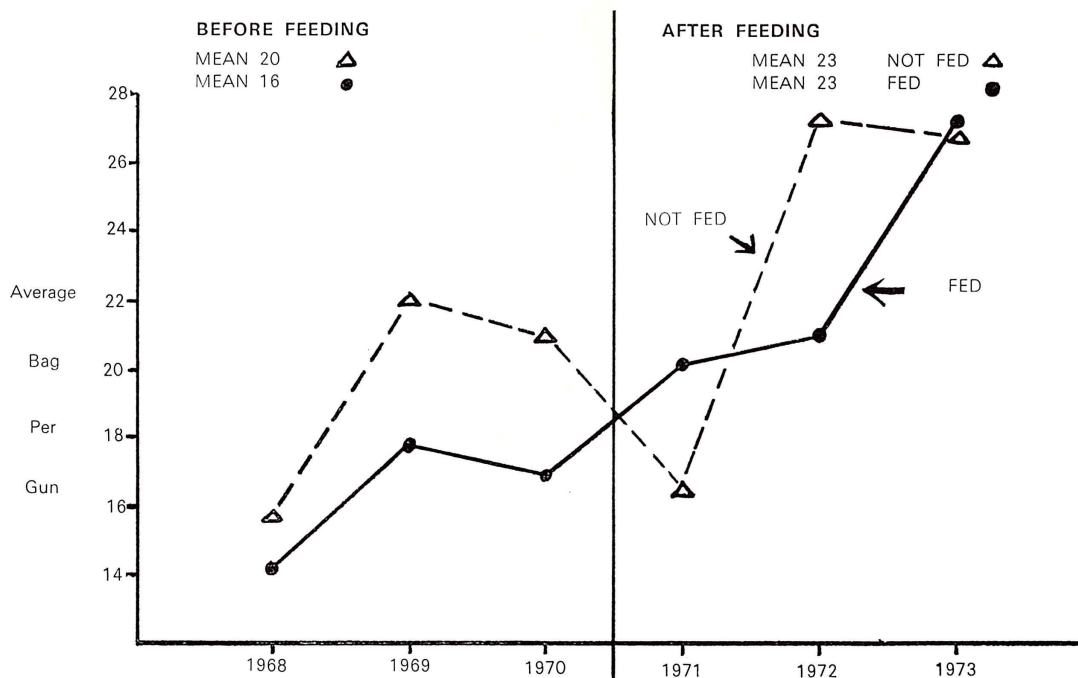


Figure 2—Shows the average bag per gun for two samples of hunters. ▼ those who never intended to feed and did not, and ● those who intended to feed and did so.

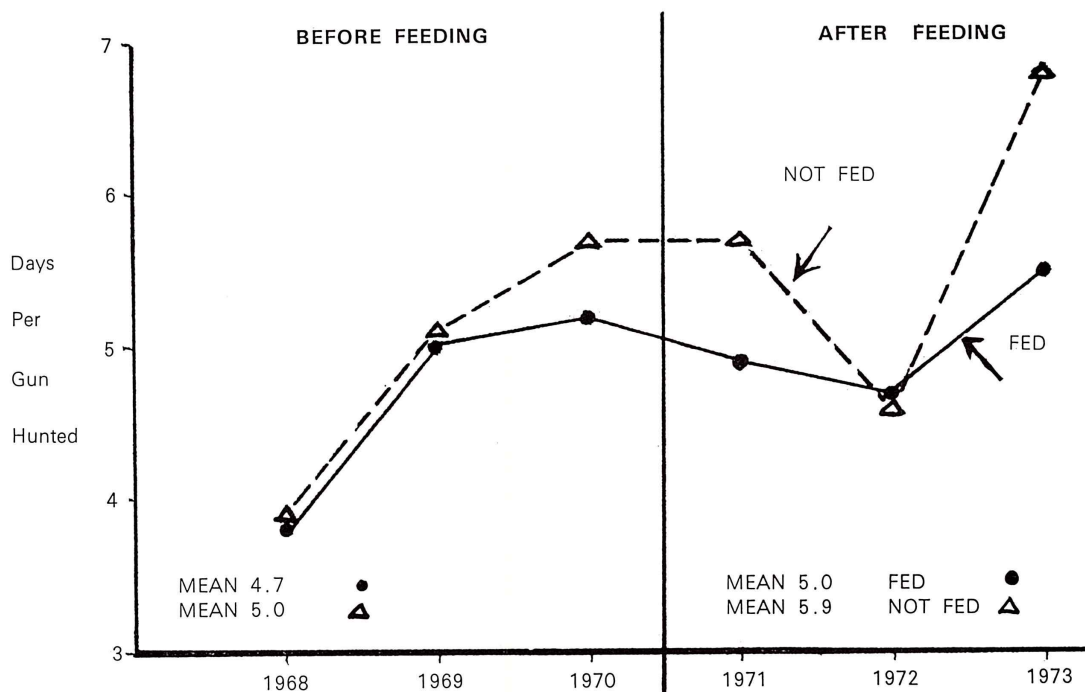


Figure 3—Shows the amount of effort each sample of hunters put into their hunting.

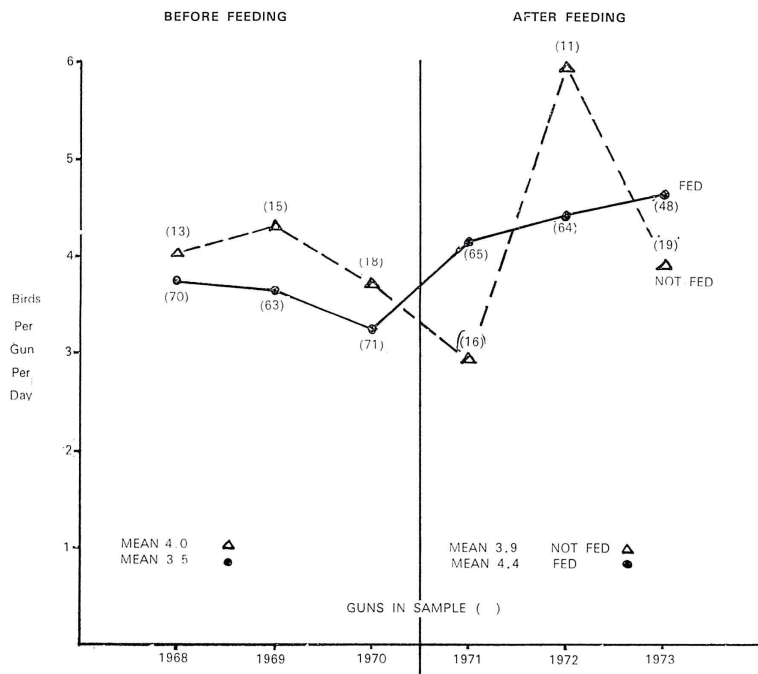


Figure 4—Shows the average number of birds shot per gun per day for the two samples of hunters.



Moulting Paradise duck. Lake Luxmore 1972



Messrs B. Waghorn, W. Barker and A. Russell trapping ducks at Lake Waituna

Waterfowls Shooting Summaries:

This is an opportune time to place on record our appreciation of the tremendous amount of work being done annually by Mr Tom Caithness, the waterfowl biologist in the research section of the Wildlife Branch, Internal Affairs Dept. Co-operating shooting diary keepers who receive these annual summaries will realise the work that has to be done before they are printed.

Library:

To the licence holders who are unaware of the fact, let us advise you that the Society maintains a very well stocked library, located at the Invercargill Public Library, and books are issued free to all licence holders.

Waterfowl Breeding – 1972–73 Season:

The following figures are from data collected by field staff in the Southland Acclimatisation Society district during the 1972–73 waterfowl breeding season.

Species	Class	No. of Broods	Total Ducklings	Average Brood
Mallard	1	35	295	8.4
	2	49	354	7.2
	3	89	702	7.8
	4	77	611	7.9
	5	160	1238	7.7
	6	78	641	8.2
Paradise	1	33	211	6.3
	2	26	148	5.6
	3	28	158	5.6
	4	25	157	6.2
	5	41	255	6.2
	6	43	270	6.2
Shoveler	1	2	14	7.0
	2	10	58	5.8
	3	7	36	5.1
	4	2	13	6.5
	5	7	33	4.7
	6	2	13	6.5
Grey	1	1	9	9.0
	2	—	—	—
	3	1	5	5.0
	4	1	6	6.0
	5	1	5	5.0
	6	—	—	—

In conclusion I would offer thanks to committee members and field staff for their support and co-operation during the year.

F. B. HENDERSON,
Chairman.

Pollution

Pollution Committee Report

Pollution control work carried out by the Committee reached its climax this year, and the little we have been able to accomplish has resulted in the acceptance of standards, which, if adhered to will improve the water quality of our streams and estuaries.

Our main endeavours have been directed towards:

1. The classification of all Southland waters, initiated almost a decade ago
2. The upgrading of some classifications which we regard as non recreational.
3. The upgrading of Dissolved Oxygen and Temperature specification of Class D. waters.
4. Investigation of all applications to discharge into natural waters, and where necessary to state a case for more adequate standards before a Regional Water Board Quality Tribunal.
5. Investigating, and where appropriate, objecting to applications to abstract water (irrigation etc).
6. Checking on all Mataura River Temporary Permits to Discharge.
7. Preparing and Presenting Submission re the Invercargill City (Reclamation) Empowering Act.
8. Pollution Surveys, New River Estuary, Makarewa and Waihopai Rivers. (Dr. Scott and Staff).

Classification of Rivers:

Twelve months ago I reported that the Classification of Southland Rivers was imminent, and that we were not likely to be satisfied with the proposed standards. Since then, public attitudes have forced a change in the general Philosophy of Classifications and these are now required to be, "A Declaration of the Minimum Standards of Quality Necessary to Promote, In the Public Interest, the Conservation and Best Use of the Water".

The Preliminary Classification published during the year was a reflection of this changed outlook. It was much better than we expected, but, because our estuaries, and many of our streams were classed "Non Recreational" objections were lodged with the Water Allocation Council. With up to 52 other Organisations and Individuals supporting us, we were able to present a good case and members who have studied the final classification will agree that considerable improvement has been effected. However a number of fine recreational streams are **still** classed "D" and Council, with the financial support of the National Executive is to take the matter to the "Town and Country Planning Appeal Board" as prescribed under the act.

It should be realised that a low classification does not automatically downgrade a stream. Classification defines the standard of treatment of the discharged waste, but in the long term the sum of all such discharges will ultimately depress the water quality standards to the permitted minimum.

There are relatively simple and economically viable techniques available to produce good quality effluents and there is no practical reason why any Southland water should be of a lower standard than class "C".

One of the major benefits of Regional Classification is that all farm wastes, dairy, pig sty, sheep yard effluents have to be registered and treated to a standard approved by the Catchment Board. This should noticeably improve the quality of all waters, initially at least.

Water Quality Standards:

In the third schedule of the act, a Coliform Bacteria Content of the water is specified. If this specification **cannot** be met there would be little point in giving the water a high classification. However, if the source of this "health risk" indicator were predominantly animal as in farming areas, the water need not be regarded as "Non Recreational" and provided that the specification for dissolved oxygen (D.O.) and Receiving Water Temperature were satisfactory, we could be content, in these special cases, with some Class "D" water.

Your Committee, together with the National Pollution Committee has been active in submitting that for Class "D" waters, the specification for "D.O." should not be less than 6 P.P.M. and the natural temperature of the receiving water should not be raised above 25°C.

These are not high figures by modern overseas standards and the Organic Pollution Load required to depress the Dissolved Oxygen Content of the water from say 10.4 P.P.M. to 6 P.P.M., is still a large one.

Rights to Discharge into Natural Water:

Any application to discharge is advertised in the local press each Friday and it is the duty of the Committee to examine each application. Where it is considered that trout, and, or wildlife are endangered by the proposed discharge, an objection to the application is lodged, and our submissions presented to a Water Quality Tribunal of the Catchment Board.

To date the Board has always met our minimum requirements, and recently permit conditions for minor discharges have been fixed by informal negotiation.

Water Abstractions:

The use of natural water for stock water and irrigation is of more than passing concern to Acclimatisation Societies, and the examination of each application to take water and to make submissions to the (Catchment) Board is a new function of the Committee. This is properly a pollution problem since any reduction in flows must result in an increased concentration of the pollution load of the stream.

The requirements of an Acclimatisation Society for its fresh water fisheries and wildlife concerns are simply that the whole natural flow or quantity of water in any particular stream be kept in its natural environments. Our wildlife stock and fresh-water fish are products of the eco-system, that is, the whole river, stream or lake, and any diminution of the quantity or quality of the water means a diminution in our fish and wildlife stocks, and our opportunity to enjoy them. The exercise of any right to divert or take natural water reduces the amount of water left for the

fish or for wildlife and apart from the obvious effects of the complete drying up of a river or stream, there are more particular effects to fisheries and wildlife, as follows:

1. **Fish**
 - 1.1 Reduction in living space.
 - 1.2 Reduction in cover.
 - 1.3 Reduction in available food.
 - 1.4 Reduction in dissolved oxygen .
 - 1.5 Inhibit movement of migatory and spawning Trout.
2. **Wildlife:**
 - 2.1 Reduction in shallow feeding areas.
 - 2.2 Reduction in nesting and escape cover.
 - 2.3 Reduction in amount of water required for the general well being of waterfowls and water birds.

Policy:

1. The Southland Acclimatisation Society fully supports the concept of multiple water use, but is every application to take water were granted, the situation would eventually arise whereby multiple use would not be possible.
2. Water for irrigation is a valid use, provided that the stream environment is not endangered.
3. Stock water abstraction would be a high priority use but draw off should be regulated so as to give emergency relief under "stress" conditions, and should be designed to keep Temperature and Dissolved Oxygen to tolerable levels.
4. An evaluation of each stream or river, and the environmental impact of abstractions should be studied before rights are issued.

Analytical Work:

Our Scientific Adviser, Dr. Scott of Otago University is at present working on the Pollution Assessment of New River Estuary and the Makarewa and Waihopai Streams. The following effluent analysis figures will be of interest:

Source of Discharge	B.O.D.	P.P.M	Ammonia P.P.M.
Wool Scour Works (Estuary)	40.4 to	83.9	1.0 to 7.2
City Sewerage Treatment Works	235.0 to	384.0	11 to 77
Meat Works, Makarewa	91.8 to	131.0	152 to 400
Meat Works, Makarewa	155.0 to	226.0	72 to 112

B.O.D.—indicates the potential oxygen demand of the effluent, and it should be noted that a clean river has a demand of 1 to 2 P.P.M. and that the recommended maximum for effluent B.O.D. is 20.0 P.P.M.

Ammonia—as a by-product in the decomposition of organic matter is harmful in concentrations as low as 1.0 P.P.M.

This analytical work is being carried out at little cost to Council, and will be extremely valuable when we start "being difficult".

For instance, in two of the above cases, the B.O.D. is greatly in excess of recently issued "Conditions of Permit to Discharge". At the appropriate time and after further analytical work, the matter will be taken up with the organisations concerned. Further, there could well be some corrolation between a massive kill of fish in the Makarewa some years ago, and the very high ammonia concentration at one of the discharges.

Legislation—Resulting from representatives initiated by this Committee, and the Catchment Boards Association, Government has now agreed to amend and consolidate the Soil Conservation and Rivers Control Act and the Water and Soil Conservation Act. The National Pollution Committee (on which Southland has a representative) has recently been engaged in preparing submissions covering:

1. Administration.
2. Water Abstractions.
3. Finance.
4. Classification and Water Quality Standards.

Unfortunately it would appear that the "Water Resources Council", the authority charged with Pollution abatement on a National basis, has not seen fit to ask for submissions from the Fisheries Division, Department of Agriculture and Fisheries, or from the Department of Internal Affairs. These are the two Departments most qualified to make Water Quality submissions. However, "it would be idle to speculate as to the reasons for by-passing these two departments".

Catchment Boards:

For the past decade, the anti-pollution voice has been very largely an Acclimatisation Society one, with very recently a lusty yell or two from the "Environmental Defence" and kindred societies.

Catchment Boards are now poised to carry on the work and will become effective once the question of adequate finance and staff has been resolved. Boards, however cannot be expected to appreciate the special requirements of Wildlife and Fisheries unless these requirements are made known in a responsible and co-operative manner by Acclimatisation Societies. In some areas lines of communication do not exist. In this context the technical evidence of Dr Scott has been of real value in convincing the Southland Catchment Board that our demands are reasonable and environmentally desirable.

We have full confidence in the Board and although it is reasonable to expect that the activities of the Committee will be greatly reduced in the next few years, we will always have a part to play, especially in those "grey areas" not covered by the act.

Thanks are Due:

1. To the Southland Catchment Board and Staff for the fact that to date all "permits to discharge" have been substantially better than the minimum permitted level.
2. To the Two Local Bodies who so effectively supported us in the recent classification objections.
3. To all those local authorities who are presently engaged in, or planning to install, sewerage treatment plants and thus giving a lead to industry.
4. To our 2 new Labour Members of Parliament, A. W. Begg and J. B. Munro, who assisted us so effectively in our representations re Water Quality Standards.
5. To Society staff and Committee members who have just undertaken a terrific year's work.
6. To Society members who are so willing to pay for "clean water".

B. R. McPHERSON
Chairman – Pollution Committee.



Dave Scott, Bob Band and Andy Russell sampling in the Invercargill Estuary, February 1973

Wildlife

Wildlife Committee Report

The Wildlife Committee has met only three times this year. However a good deal of continuing work has been undertaken.

Estuaries:

In our 1972 annual report we outlined the importance of estuaries as wildlife and fisheries habitat, and gave some details of the Society's effort to inform the public of the values involved. This had included the production and distribution of a pamphlet stressing the importance of estuaries generally. Twelve months have passed, and it is with some satisfaction that we review the situation.

We think it is fair to say that the pamphlet was well received and has produced favourable reaction. Supplies from the original printing of 20,000 were soon exhausted following many requests for further supplies from many parts of the country and it has been necessary to order a further 12,000 copies. With our consent C.A.C. reproduced most of the text and photographs from the pamphlet in their periodical "C.A.C. Sporting Bulletin".

Another important occurrence was the setting up of a technical advisory committee by the city council in respect of the Invercargill estuary, on which the interests of wildlife are represented by the Senior Field Officer Mr R. R. Sutton.

Public disapproval of untidy rubbish dumping in the estuary has no doubt been partly responsible for this city council action, but we would hope that our action in drawing attention to more important factors has been the principal reason for the setting up of this committee.

Regular committee meetings have been held and efforts to date have been mainly directed towards the identification and assessment of problems and their causes. During September the committee invited a panel of scientific experts from universities and other scientific agencies to a special meeting in Invercargill to give advice and discuss ways and means of setting up the necessary investigations. These are likely to be biological studies involving water quality and fauna, water movement, recreational uses, sedimentation, marginal vegetation and a fauna assessment. An historical report on the estuary is being prepared by Mr P. Chandler of Invercargill by arrangement with the Committee. As previously reported a study of the Spartina grass problem and possible control measures has already been set up by the Society in conjunction with I.C.I. and the botany department at Otago University. The preliminary investigation into water quality and fish life by Dr D. Scott of the Zoology dept. last summer has been completed and will be most useful in establishing base lines to work from.

The Society also made submissions to the Parliamentary Local Bills Committee concerning the Invercargill City Council (Reclamation) Empowering Act 1973 which has since been passed by Parliament. On this occasion we again stressed the importance of the estuary as a wildlife habitat and a recreational area and drew attention to a number of unsatisfactory aspects of the Bill. We feel that far too much consideration was given to the unsatisfactory appearance of the rubbish dump and far too little to the major problems of land reclamation, Spartina infestation and effluent standards.

Lack of space prohibits the printing of the submission in full in this report but we quote the summary below:

'The Society regrets having to make a submission in such critical terms, but in the circumstances we feel we have no alternative. Our statutory responsibilities regarding wildlife and fisheries are plain, and quite clearly, extremely important habitat is involved. The Society is well informed on the wildlife and recreational values of the New River estuary. The information we have submitted is of necessity brief, but is reliable and in no way exaggerated.

The Society understands the meaning of the word conservation and believes in the multiple use concept. In this case it is the strong tendency towards land reclamation only, which is contrary to this concept, and which causes us so much concern. Of further concern is the fact that a local body has promoted and carried out works without authority, which have had a serious adverse effect on the environment.

Since these works, carried out over the years, are responsible for existing problems, we think it reasonable that any funds accrued as a result of these works, should be directed towards dealing with these problems. We wish to stress this point in the strongest possible terms.

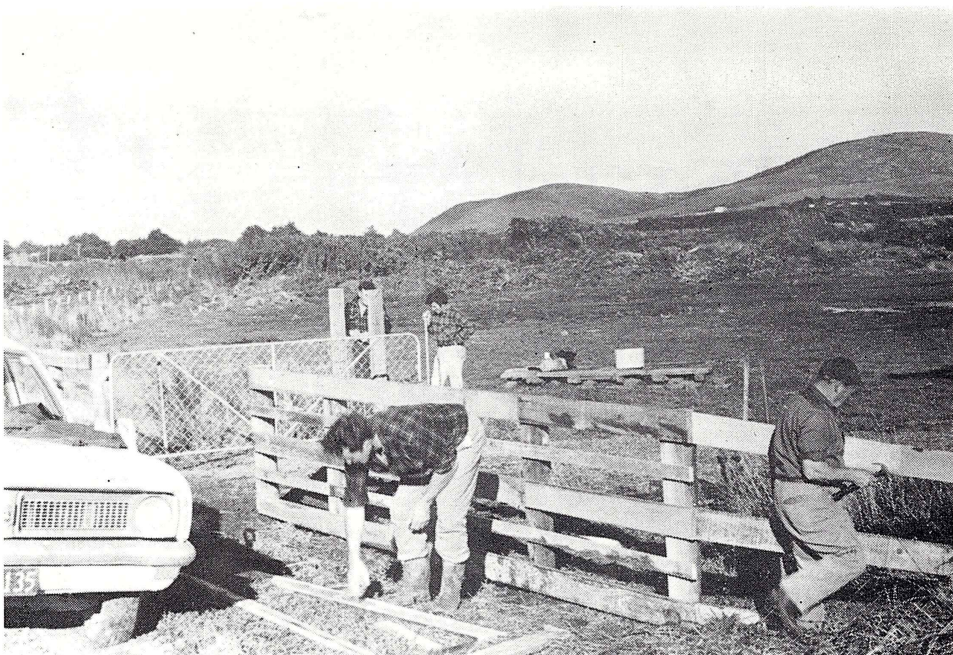
It is appreciated that it is probably not practical to include a clause in this empowering act which will prohibit further reclamation of New River estuary beyond the powers granted, but point out that there is an urgent need for such legislation. The Nature Conservation Council draws attention to the need to prohibit further reclamation in this estuary. We recommend that consideration be given to the need for special comprehensive legislation which will give protection to estuaries in general and prevent recurrences of the Invercargill situation".

Members will know that it is now necessary for environmental impact reports to be made in respect of works projects. At the very least we can rest assured that proper consideration will be given to any future proposals before they are permitted to proceed. We feel that our estuary programme this year has been very worthwhile.

Lake George Wildlife Reserve:

Work has proceeded in this reserve during the year but not with as much speed as we would wish, largely due to financial restrictions. A further 50 chains of fence line have been prepared along the north-western boundary but work has been held up by a shortage of fencing material. A new post and rail entrance fence and gate have been erected and a picnic area cleared and levelled. A signboard has also been erected and a boat launching access excavated. Wallace County Council have made a useful contribution in the form of a gravelled motor access track and we wish to express our appreciation of their co-operation. More tree planting has been carried out but a very great deal more remains to be done. Noxious weeds are a problem. Spraying and some further bulldozing along the road frontage has been carried out.

Regrowth and regeneration of native vegetation in areas where stock are now excluded is very noticeable. A recolonisation by such species as Fernbirds and Crakes in these areas is now a real possibility in the foreseeable future.



Society Field Staff erecting fencing at Lake George



Messrs Lobb, Russell and Boud working on the Boundary Fence at the Nichol Bush Reserve

Nicol Bush Reserve:

Further progress has been made with this 30 acre native bush area at Gorge Road. By agreement with the owner Mr R. C. Nicol the Society have had fence lines cut and erected 20 chains of fence to exclude stock from the bush. The work was done partly by contract and partly by the field staff. Steps are now in hand to have tenure of the land made over to the Society. This reserve will be known as the Nicol Bush Reserve.

In view of the great difficulties being experienced in trying to secure this type of valuable native bush remnant for reservation, the Society has cause to feel pleased about this transaction.

Other Reserves:

Further development work has been done at the Lake Luxmore wildlife reserve during the year. This has included the erection of an entrance gate and the excavation of a boat access channel. More plantings of three species of oak trees have been made.

Although the Wilderness wildlife reserve has not been gazetted as such yet, some work has been commenced. Poor quality fencing has been strengthened and tree planting is well under way. A comprehensive tree planting plan has been drawn up with assistance from members of the Northern Southland Farm Forestry Assn., and their advice is much appreciated.

In the Mabel Bush flora and fauna reserve we have carried out maintenance of noxious weed control and made regular patrols to check fences etc.

Negotiations are still in train concerning a ten acre wetland area at Orepuki with a view to having it gazetted a Wildlife Management Reserve.

Associate Membership Scheme:

As members will be aware an Associate Membership Scheme was established in the belief that there were numerous citizens who were not holders of either fishing or shooting licences and therefore not eligible for ordinary Society membership, but who were interested in making a financial contribution towards some aspects of the Society's work. Following the establishment of the Scheme with an initial membership of 62, a trust fund was established under the administrative control of the Conservation and Anti-pollution Committee of this Society. (which includes Associate members). Contributions from Associate Members in the initial year amounted to \$464 to which this Society added a further \$500. At the first general meeting of Associate Members on the 4.11.71 it was decided that the first project to be undertaken and charged against the trust fund was the production of an information pamphlet stressing the importance of estuaries. This was done and the original printing of 20,000 copies was well distributed both locally and throughout New Zealand. It is difficult to judge the success of such a project, but we feel that this first project of the Associate Membership Scheme was very successful. Unfortunately interest in this Scheme seems to have waned and its future is now in the balance. This Society is attempting by means of an information circular to revive interest and only time will tell whether there is sufficient public interest or perhaps we should say sufficient public concern to encourage those who pay lip service to conservation, to make their commitment a little stronger.

A comprehensive circular has been sent to all Associate Members setting out in detail the work undertaken by this Society in the fields of Conservation and Anti-pollution. There is not the space available in this publication to reproduce the detail. However in summary, we can say that the total Society expense in this area during the last 12 to 18 months approximately, amounted to \$9,635. After deducting the contributions from Associate Members of \$464. This left a total cost to this Society of \$9,171. It is the Society's contention that much of this work is for the good of the community as a whole and not only the licence holding fishermen and shooters. With this aim in mind a copy of the circular has been sent to all Cabinet Ministers in the hope that when they are reviewing the work of Societies throughout New Zealand, due consideration can be given to this aspect of the Society's work. An important point to arise from the review of this aspect of the Society's work was the fact that many people are under the impression That Society funds are subsidised by Government. In fact the reverse is the case. This Society is bound by law to pay levies, which during the 1972 financial year amounted to \$9,387 or 16.5% of Society's total income. There is a great deal of similar work which still urgently requires attention, but cannot be proceeded with due to lack of funds. We still hold the view that the Associate Membership Scheme was soundly based and that these people are willing to assist and we hope that the Scheme will gain momentum again and provide the assistance to Society work that it was designed to do.

C. O. MARSHALL,
Chairman.

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